DEERFIELD RIVER WATERSHED

5-Year Watershed Action Plan

2004-2008

Downstream of Fife Brook Dam

The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

The Commonwealth of Massachusetts

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Dear Friends of the Deerfield River Watershed:

It is with great pleasure that I present you with the 5-Year Watershed Action Plan for the Deerfield River Watershed. The plan will be used to guide local and state environmental efforts within the Deerfield River Watershed over the next five years. The plan expresses some of the overall goals of the Executive Office of Environmental Affairs, such as improving water quality, restoring natural flows to rivers, protecting and restoring biodiversity and habitats, improving public access and balanced resource use, improving local capacity, and promoting a shared responsibility for watershed protection and management.

The Deerfield River Watershed Action Plan was developed with input from the Deerfield River Watershed Team and multiple stakeholders including watershed groups, state and federal agencies, Regional Planning Agencies and, of course, the general public from across the Watershed. We appreciate the opportunity to engage such a wide group of expertise and experience as it allows the state to focus on the issues and challenges that might otherwise not be easily characterized. From your input we have identified the following priorities:

- Coordinate Flow Management to Benefit Multiple Uses
- Protect and Improve Water Quality in the Watershed
- Restore and Improve Stream Continuity and Aquatic Habitat
- Protect Wetlands and Promote Terrestrial Habitat Diversity
- Provide Safe Recreation and Public Access/Use
- Protect Open Space and Maintain Rural Landscape

I commend everyone involved in this endeavor. Thank you for your dedication and expertise. If you are not currently a participant, I strongly encourage you to become active in the Deerfield River Watershed restoration and protection efforts.

Regards,

Ellen Roy Herzfelder

Ellen Roy Herzfelder

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List of Abbreviations

AMC	Appalachian Mountain Club
APR	Agricultural Preservation Restriction
BRPC	Berkshire Regional Planning Commission
cfs	cubic feet per second
COE	United States Corps of Engineers
ConEd	Consolidated Edison
DPW	Department of Public Works
DRWA	Deerfield River Watershed Association
DRWT	Deerfield River Watershed Team
EOEA	Executive Office of Environmental Affairs
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FLT	Franklin Land Trust
FRCOG	Franklin Regional Council of Governments
MDAR	Massachusetts Department of Agricultural Resources
MDCR	Massachusetts Department of Conservation and Recreation
MDEP	Massachusetts Department of Environmental Protection
MDFG	Massachusetts Department of Fish and Game
MDHCD	Massachusetts Department of Housing and Community Development
MDPH	Massachusetts Department of Public Health
MDR	Massachusetts Department of Revenue
MHD	Massachusetts Highway Department
mi^2	square miles
msl	Mean Sea Level
MW	Megawatt
NHESP	Natural Heritage Endangered Species Program
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
OSC	Open Space Committee
TMDL	Total Maximum Daily Loads
TNC	The Nature Conservancy
TTOR	The Trustees of the Reservation
USDA	United States Department of Agriculture
USFWS	United State Fish and Wildlife Service
USGen	USGen New England Inc.
USGS	United States Geological Survey
WAP	Watershed Action Plan

1 INTRODUCTION

The purpose of this section is to describe the process used to develop this action plan, as well as provide an overview of the project study area.

1.1 Background

The following Five-Year Watershed Action Plan (WAP) was developed for the Deerfield River Watershed (watershed). It will serve as the strategic plan for the Massachusetts Executive Office of Environmental Affairs (EOEA) and the Deerfield River Watershed Team (DRWT) (Appendix B) for calendar years 2004-2009.

This 5-Year WAP represents a broad approach to watershed management, and is the end product of an extensive planning process and the start of an ambitious implementation phase. The process incorporated as much input as possible from the various members of the DRWT and from stakeholders throughout the watershed.

This WAP will help prioritize which projects receive state and federal grants and loans, regulatory decision-making, and educational/technical assistance programs to solve the most important environmental problems affecting communities. In addition to describing goals and objectives and a long-term vision for the watershed, the WAP recommends numerous priority actions for the next five years. An action plan matrix recommends lead parties for each action, as well as proposed timeframes for reaching the five-year goals. The actions in this plan are structured according to five overarching goals (see below) for the Deerfield River Watershed, each of which includes several smaller objectives.

1.2 Vision Statement

Stakeholders within the watershed consist of a very diverse group of individuals and organizations whose interests in watershed planning and other activities are varied. Stakeholders are working together to find a balance between achieving their individual goals and meeting the needs of the others. Although each member may have a different vision of the watershed's future, open dialogue and collaborative efforts to find solutions to environmental challenges are a common thread that binds them. By continuing these efforts, measurable improvements in water quality, stewardship, physical environmental characteristics, and biological health and diversity will occur.

As part of discussions with many stakeholders throughout the watershed, several overarching goals were identified for the WAP that, when undertaken as specific priority actions, can help stakeholders achieve long-term environmental quality within the watershed. Listed below are the six goals.

- Coordinate Flow Management to Benefit Multiple Uses
- Protect and Improve Water Quality in the Watershed
- Restore and Improve Stream Continuity and Aquatic Habitat
- Protect Wetlands and Promote Terrestrial Habitat Diversity
- Provide Safe Recreation and Public Access/Use
- Protect Open Space and Maintain Rural Landscape

1.3 Planning Process

This planning process began with the development of an advisory committee, which consisted of select members of the DRWT (see Appendix A). The role of the advisory committee, which met on three separate occasions, was to provide overall direction and vision for this effort. Subsequently, a watershed assessment report, which summarized much of the existing water quantity and quality, fisheries, wildlife and terrestrial, recreation, and open space information currently available for the watershed was compiled. Based on the existing information sources, the watershed assessment report also identified priority issues currently affecting the watershed's resources.

In addition, a series of meetings and discussions with interested stakeholders were conducted to identify several other priority issues and concerns (see Appendix A). These efforts included two focused brainstorming sessions held on March 3rd and 18th, 2004 with various stakeholders including environmental interest groups and local, state, and federal natural resource professionals within the watershed. Both sessions were held during the daytime at the Franklin Regional Council of Governments (FRCOG) in Greenfield, Massachusetts. In addition, town officials and conservation commission members had the opportunity to attend a similar evening session held at the Greenfield Community College in Greenfield, Massachusetts, during the evening of March 18th.

Also, on the evening of March 31st, 2004, a public forum was held at the Greenfield Community College Main Campus to present the watershed assessment report, and on April 24th, 2004 aspects of the WAP were presented at the Deerfield River Watershed Association's (DRWA) annual forum held at the Mohawk Trail Regional High School in Buckland, Massachusetts.

Throughout the planning process, efforts were made to engage town conservation commissions and planning boards (see Appendix A). In addition to the meetings described above, several telephone discussions were held with representatives from all towns. In addition, a survey was distributed to several individuals living within the watershed, where participants were asked about their opinions regarding natural resources and areas of concern.

Based on the priority issues and concerns identified through the outreach process, a series of goals and objectives were identified. The WAP was then developed with specific priority actions that can be implemented within the watershed during the next five years to address the previously identified goals and objectives. The WAP also identifies potential organizations and funding sources that could be used in implementing the proposed watershed projects.

The WAP builds upon other planning efforts undertaken by the DRWT, as well as those conducted by other local, state, and federal agencies. Priority actions listed in the WAP are not limited to projects best suited for government action, but also identified are potential actions that could be undertaken by a variety of stakeholders in the watershed.

1.4 Overview of the Planning Area

The Deerfield River begins near the towns of Glastenbury and Stratton in Vermont and flows approximately 70 miles mostly south and east to its confluence with the Connecticut River in Greenfield, Massachusetts (Figure 1.4-1). The watershed drainage area is 665 square miles with about half the area in southern Vermont (318 square miles) and half in western Massachusetts (347 square miles). The Deerfield River Watershed is bordered by the Connecticut River Watershed to the east, the West River

Watershed to the north, the Hudson-Hoosic River Watershed to the southwest, and the Westfield River Watershed to the southeast.

The Deerfield River Watershed is comprised of 12 major subwatersheds (Figure 1.4-1):

- East Branch Deerfield River Subwatershed-(36.9 square miles);
- North Branch Deerfield River Subwatershed-(55.9 square miles);
- West Branch Deerfield River Subwatershed-(31.8 square miles);
- Pelham Brook Subwatershed-(13.7 square miles);
- Cold River Subwatershed-(31.7 square miles);
- Chickley River Subwatershed-(27.4 square miles);
- Mill Brook Subwatershed-(15.0 square miles);
- Clesson Brook Subwatershed-(21.2 square miles);
- North River Subwatershed-(92.9 square miles);
- South River Subwatershed-(26.3 square miles);
- Green River Subwatershed-(89.8 square miles); and
- Deerfield River Mainstem-(258.6 square miles).

The total population within the entire watershed is approximately 47,000. The majority of the watershed's population is centered in Greenfield, Massachusetts (18,168). Land surface elevations range from just under 4,000 feet above sea level in the headwaters of the watershed to 120 feet above sea level at the mouth of the Deerfield River. The river gradient is steep, which makes the river ideal for hydropower generation; as a result there are 11 hydroelectric facilities along the Deerfield River mainstem. Major roads running through the watershed include Interstate 91, State Highway Route 2, Route 10, Route 112, Route 116, and Route 8A-L (Figure 1.4-2). A major railroad also runs along the Deerfield River from Deerfield to Florida, Massachusetts.

1.5 Coordination with Other Planning Groups and Processes

Over the past several years, two groups have been particularly active in protecting and improving the quality of the watershed. Their assistance to EOEA will be valuable in coordinating and implementing many of the priority actions proposed within this WAP.

The aforementioned DRWT was established through the former Massachusetts Watershed Initiative (MWI), which is a broad partnership of state and federal agencies, conservation organizations, businesses, municipal officials and individuals. Initiated in 1993 by community partners and the EOEA, the MWI was an innovative, results-oriented program that protected and restored natural resources and ecosystems. The DRWT is comprised of representatives of government agencies and community partners (non-profit organizations, municipal boards, and businesses), who have coordinated to implement watershed protection efforts. Beginning in 1998, the DRWT had a full-time watershed team leader employed by EOEA. During that time, the former watershed team leader coordinated the development of annual work plans, which served as a guide for coordinating DRWT efforts. Also, these annual work plans have provided a basis for the development of this WAP. Although funding for MWI was discontinued in 2003, the DRWT still remains active in planning, coordinating, and implementing projects throughout the watershed.

The DRWA is also active in preserving, protecting and enhancing the natural resources of the Deerfield River Watershed. The group was established in 1988 as a nonprofit volunteer membership organization, and since that time has continued to educate, advocate and organize for the protection of the watershed. In

particular, the DRWA has undertaken many capacity building activities such as a hikes and bikes program, volunteer monitoring, public forums, and volunteer cleanup activities.

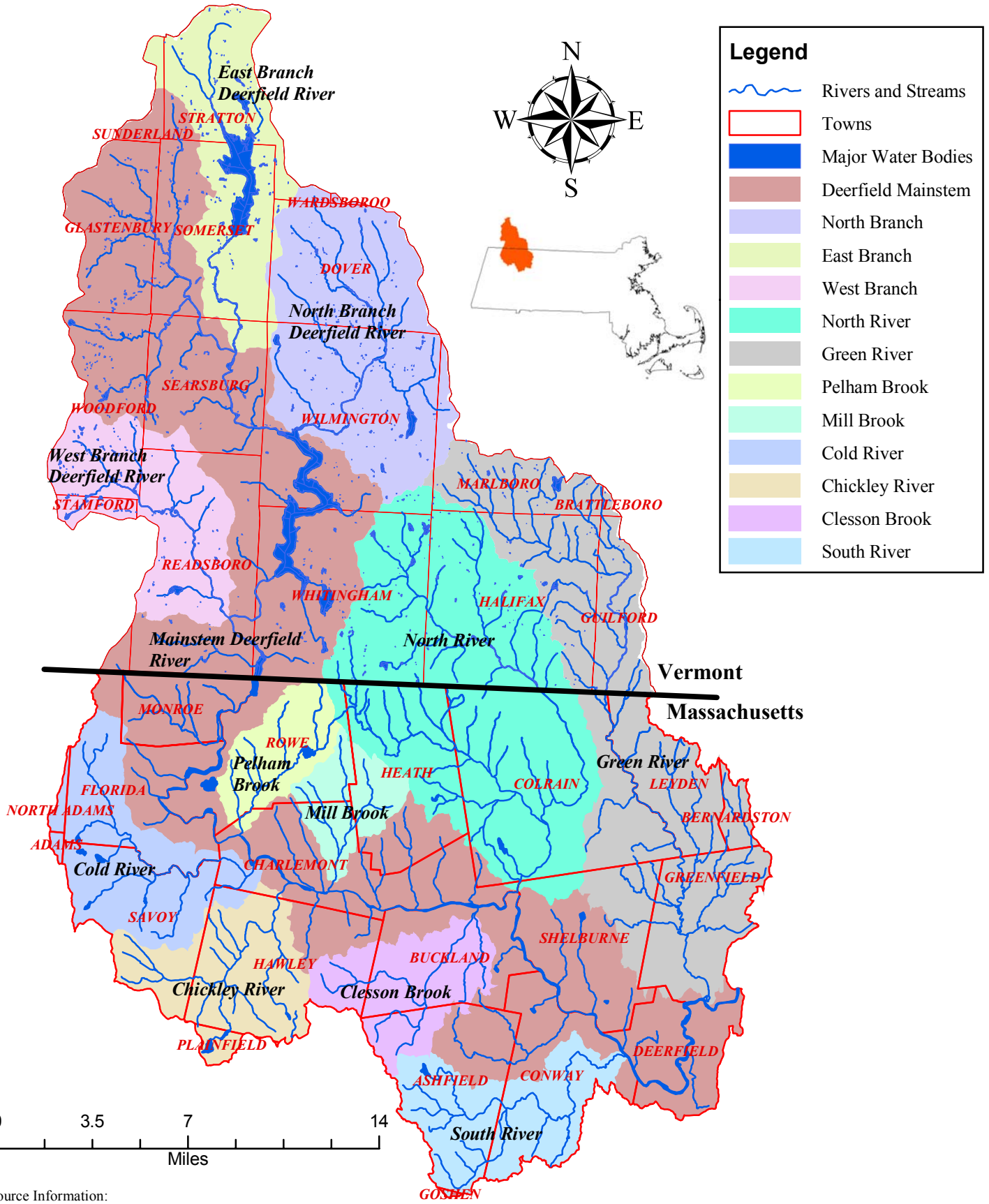
Concurrent to this action planning process, another action planning exercise was being undertaken by the FRCOG that was focused on regional open space and recreation resources (FRCOG 2004). This WAP incorporates priority actions from that plan by reference. In addition, a number of priority actions of relative significance from that plan have been directly incorporated into this WAP, and have been denoted with a citation.

This WAP should be coordinated with several other open space planning activities that have occurred throughout the watershed. Currently, four towns within the watershed have completed open space plans; while another four towns have open space plans in development. In addition, a regional open space plan for five communities in watershed has been recently completed.

The Massachusetts Department of Environmental Protection (MDEP) is in the process of drafting the Deerfield River Water Quality Action Plan, which will outline action strategies to address surface water quality issues within the watershed. This WAP should be coordinated with MDEP's planning efforts.

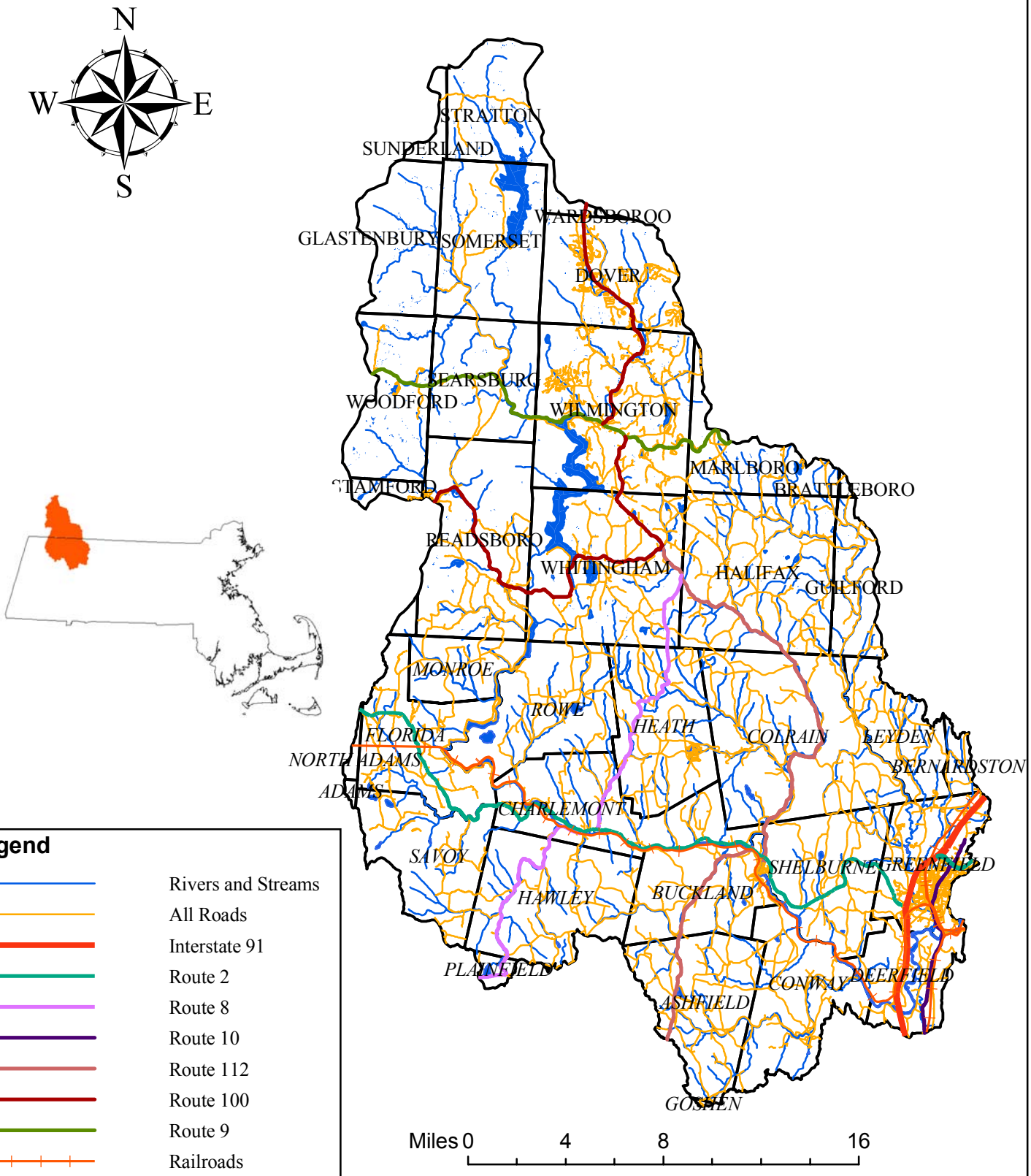
Although half of the watershed lies in southern Vermont and the other half in western Massachusetts, an effort should be made to coordinate actions of regional significance between states, particularly as they relate to water quality, streamflow, and erosion and sedimentation. In addition, similar watershed planning activities are envisioned for the Vermont portion of the watershed in the near future. These activities will be undertaken by the State of Vermont, and are tentatively planned to occur within the next 3-5 years.

Figure 1.4-1: Deerfield River Watershed Map



Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs
- Vermont Center for Geographic Information

Figure 1.4-2: Major Roads and Railroads in the Deerfield River Watershed



Legend

- Rivers and Streams
- All Roads
- Interstate 91
- Route 2
- Route 8
- Route 10
- Route 112
- Route 100
- Route 9
- Railroads
- Towns
- Major Water Bodies

Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs
- Vermont Center for Geographic Information

2 GOALS, OBJECTIVES AND PRIORITY ACTIONS

Listed below are individual priority actions to be taken toward each goal and objective described. For more information on lead parties for implementing the following actions and potential funding sources, see the Action Plan Matrix in Chapter 3 and Potential Sources of Funding in Chapter 4, respectively. In addition, the action plan matrix (Chapter 3) describes the timeframe over the next 5 years for implementing each action based on its priority (e.g., a start date of 2004 would indicate a high priority).

Based on overall public input, implementation of actions to address non-point source pollution should be the primary focus within the watershed in the near term. In particular, an upcoming MDEP 604(b) funded Non-point Source Pollution Assessment study of the watershed should be the overall priority action to meet this important water quality objective.

2.1 Goal: Coordinate Flow Management to Benefit Multiple Uses

2.1.1 Key Assessment Findings

There are 11 hydroelectric facilities along the Deerfield mainstem (Table 2.1-1) including one pumped storage facility (Bear Swamp Pumped Storage Facility). All of the facilities are currently owned by USGen New England (USGen), with exception of the Gardners Falls facility, which is owned by Consolidated Edison (ConEd). These facilities control the river flow and serve to alleviate downstream flooding as well as produce electricity. In particular, the Somerset (1,623 acres) and Harriman (2,039 acres) reservoirs were constructed for seasonal water storage; retaining the majority of spring runoff, thereby, decreasing flooding during periods of high water and allowing for augmented summer flows to enhance power production, as well as recreational activities. In addition to altering seasonal flow regimes, hydroelectric flow regulations affect daily streamflow patterns as well. Several hydroelectric projects operate on a daily peaking schedule and release variable flows throughout the day, often ranging from full generation to minimum flows. Most of the power projects were built in the early 1900's and their impoundments have since become an integral part in the river's ecologic and recreational character.

Table 2.1-1: Hydroelectric Projects Located on the Mainstem Deerfield River (Source: FERC 1997)

Station Name	River Mile	State	Capacity (MW)
Somerset	66.0	VT	0
Searsburg	60.3	VT	4.2
Harriman	48.5	VT	33.6
Sherman	42.0	VT / MA	7.2
Station No. 5	41.2	MA	17.6
Bear Swamp	39.0	MA	600
Fife Brook	37.0	MA	11.3
Station No. 4	20.0	MA	4.8
Station No. 3	17.0	MA	4.8
Gardners Falls	15.7	MA	3.6
Station No. 2	13.2	MA	4.8

The hydroelectric facilities on the Deerfield River mainstem are regulated by the Federal Energy Regulatory Commission (FERC) under three federal licenses.

- Deerfield River Project (FERC No. 2323) which includes the following eight projects: Somerset, Searsburg, Harriman, Sherman, Station Nos. 5, 4, 3 and 2.

- Bear Swamp Pump Storage Project (FERC No. 2669) which includes the following facilities: Fife Brook Reservoir which serves as the lower reservoir and Bear Swamp Reservoir which serves as the upper reservoir for the pump storage project.
- Gardners Falls Project (FERC No. 2334) which includes only the Gardner Falls facility.

New FERC licenses were issued for the Deerfield River Project and Gardners Falls Project in 1997 (expiration 2037). During the relicensing proceedings, overall flow management (including minimum flows) for the mainstem Deerfield River was determined through studies and negotiations with stakeholders, who represented a variety of interests.

However, since the advent of electric utility deregulation, which occurred after the relicensing was complete, flow related concerns have been raised by some river users, particularly anglers. Specifically, the market-based bidding process used to determine when power generation occurs, has resulted in frequent and unscheduled high flow releases below several hydroelectric facilities on the mainstem Deerfield River. These conditions have raised access and river safety concerns for several river users (e.g., swimmers, anglers). USGen maintains a river flow information phone that forecasts a tentative flow release schedule over a 24-hour period. However, the predictions are often inaccurate due to changing generation demands. In addition, concerns have been raised that the rapid changes in flow caused by hydropeaking create unstable habitats that reduce the abundance and diversity of aquatic macroinvertebrates and fish. However, there is currently a lack of data to properly evaluate these concerns (see Section 2.3 for more details relative to a proposed ecological assessment of various river reaches).

2.1.2 Objectives and Priority Actions

The following is a list of objectives and priority actions focusing on the goal of coordinating flow management to benefit multiple uses within the Deerfield River Watershed.

Objective

- Maintain predictable flow releases below hydroelectric facilities on the mainstem Deerfield River to benefit all river users and enhance ecological integrity.

Priority Actions

- Examine streamflow data to quantify the timing, magnitude, and frequency of flow fluctuations resulting from operation of the hydroelectric system. Data from the United States Geological Survey (USGS) gages located in Charlemont and West Deerfield, as well as a recently installed gage below the Fife Brook Dam should be utilized for this analysis.

- Hold a forum with USGen and other interested parties of the FERC license settlement agreement to discuss whether releases from the hydroelectric dams are meeting the FERC license requirements as well as the Massachusetts Water Quality Certification requirements.

- Work collaboratively with Representative Daniel Bosley to craft legislation that will result in scheduled and predictable flow releases, which will enhance the use and ecological integrity of the Deerfield River.

2.2 Goal: Protect and Improve Water Quality in the Watershed

2.2.1 Key Assessment Findings

Overall, water quality in the Deerfield River Watershed is quite good; however, several areas have encountered local water quality problems. These areas include concerns related to both point and non-point sources of pollution. Point source pollution refers to identifiable, discrete sources of pollution to rivers and ponds, such as pipe discharges from businesses or sewage treatment plants. These point sources are only legal if they are permitted under a federal program called the National Pollutant Discharge Elimination System (NPDES). Non-point source pollution applies to all other types of water pollution, generally stormwater runoff from precipitation and snowmelt, that can contain motor oils, floating debris, silt, salts, bacteria, pesticides and fertilizers.

In terms of point source pollution, there have been several wastewater treatment plant upgrades over the past five years, which have helped to address some water quality concerns. However, there is currently no mechanism for independent monitoring of these outfalls to ensure discharges are in compliance with NPDES permit standards.

There are several priority issues identified in the watershed assessment report and by participants in this planning process related to non-point source pollution within the watershed. These issues are related to landfills within the watershed, several junkyards and illegal garbage dumping areas, stormwater runoff from urban areas and rural dirt roads, road salt and herbicide/pesticide application, runoff from the East Deerfield railroad yard, petroleum spills, hazardous material spills into the river from major rail and truck transportation routes, sewage contamination from failing private septic systems and municipal sewage infrastructure, streambank erosion, and agricultural runoff.

Davis Mine Brook is a sub-tributary and begins in Rowe, Massachusetts before flowing into Mill Brook in Charlemont, Massachusetts. As described in the watershed assessment report, Davis Mine Brook has been severely impacted by the now defunct Davis Mine, which was a sulfur mine containing pyrite and was active from 1882 to 1910 when it collapsed and groundwater filled the shafts. Since that time, extremely acidic water ($pH < 2$) has been entering the Davis Mine Brook and has led to the disappearance of fish and many macroinvertebrates. Recently the University of Massachusetts was awarded a National Science Foundation Grant to study the biological, chemical and hydrologic processes at the mine site (MDEP 2003a).

Several lakes and ponds within the watershed have been characterized by the presence of invasive plant species. Priority areas include Bog and Burnett Pond in Savoy, Goodnow Road Pond in Buckland, Hallockville Pond in Hawley/Plainfield, Little Mohawk Road Pond in Shelburne, McLeod Pond in Colrain, Pelham Lake in Rowe, Plainfield Pond in Plainfield, and Schneck Brook Pond in Conway (MDEP 2003a).

Section 303(d)[1] of the Clean Water Act, requires that various states identify waterbodies that do not meet standards and require the development of Total Maximum Daily Loads[2] (TMDLs) for these waterbodies.

[1] The Clean Water Act contains several sections requiring reporting on the quality of waters. Section 303(d) requires, from time to time, a list of waters for which effluent limitations are not sufficient to meet water quality standards. In its regulations implementing Section 303(d), the Environmental Protection Agency has defined "time to time" to mean on April 1 of every even-numbered year.

The waterbodies requiring a TMDL assessment, per the Massachusetts Year 2002 Integrated List of Waters, within the watershed are illustrated in Table 2.2-1 (MDEP 2003b).

Table 2.2-1: Massachusetts Category 5 Waters (Waters requiring a TMDL) (Source: MDEP 2003b)

Name	Location	Cause of Impairment
Deerfield River	Vermont line/Monroe/Rowe, to confluence with Cold River, Charlemont.	Metals
Deerfield River	Confluence with Cold River, Charlemont to confluence with North River, Charlemont/Shelburne Falls.	Unknown Toxicity, Metals, and Chlorine
Chickley River	Confluence with Tilton and Horsefords brooks, Savoy to confluence with Deerfield River, Hawley.	Pathogens
Davis Mine Brook	Headwaters, just south of Dell Road, Rowe to confluence with Mill Brook, Charlemont.	pH, Other Habitat Alterations
Green River	Vermont line, Colrain to Greenfield WWTP, Greenfield.	Pathogens, Metals, Cause Unknown
Green River	Greenfield WWTP to confluence with Deerfield River, Greenfield.	Unionized Ammonia, Pathogens, Metals, Cause Unknown
North River	From confluence of East and West Branches of the North River, Colrain to confluence with Deerfield River, Shelburne.	Pathogens, Taste, Odor and Color
South River	Emments Road Ashfield to confluence with Deerfield River, Conway.	Pathogens, Other Habitat Alterations, Cause Unknown
Planfield Pond	Planfield	Metals, Noxious aquatic plants
Sherman Reservoir	Rowe/Monroe/Whitingham, Vt.	Metals
Tannery Pond	Savoy	Flow Alteration

2.2.2 Objectives and Priority Actions

The following is a list of objectives and priority actions focusing on the goal of protecting and improving water quality within the Deerfield River Watershed. Based on overall public input, implementation of actions to address non-point source pollution should be the primary focus within the watershed in the near term. A MDEP 604(b) funded Non-point Source Pollution Assessment study of the watershed should be the overall priority action to meet this important water quality objective.

Objective

- Identify and minimize point sources of pollution throughout the watershed
- Identify and minimize non-point sources of pollution within the watershed
- Control the infestation and spread of invasive aquatic plant species within the watershed

Priority Actions

- Facilitate annual joint meetings with neighboring towns' Conservation Commissions and Boards of Health to maintain a cooperative approach to water resource protection and to discuss the potential for

[2] A TMDL is the total amount of a pollutant that a waterbody may receive from all sources without exceeding water quality standards.

collaboration on water quality monitoring and on other non-point source pollution needs (FRCOG 2004).

- Continue water quality monitoring by MDEP and DRWA of the Deerfield mainstem and its tributaries for in-situ parameters, chemistry and bacteria. Also, coordinate monitoring activities with appropriate agency officials in the Vermont portion of the watershed. Perform fish toxics monitoring to investigate impact of mercury contamination from Sherman Reservoir (MDEP 2003a)

- Support the reclassification of eligible streams as "Cold Water Fisheries". The reclassification will provide an additional level of protection for streams. Coordinate this action with the MDEP and MDFG. There are 61 priority streams identified for reclassification in MDEP's water quality assessment report (MDEP 2003a).

- Implement the recommendations of the Fuss and O'Neill, Inc. (2003) landfill assessment study for the watershed. Priority areas include the following (Figure 2.2-1):

    - Management of the Rowe Landfill along Pelham Brook, including removal of solid waste from Pelham Brook, cleanup of refuse along the base of the landfill, and repair and stabilization of the eroded areas of the landfill side slopes. Additional field investigation may be warranted to further assess the environmental risk posed by the landfill and determine the need for corrective/remedial action.

    - Management of the Charlemont Landfill, including removal of the exposed bulky waste adjacent to Tatro Brook, and additional field investigation to further assess the environmental risk from the landfill and determine the need for corrective/remedial action. Inspection and additional field investigation of the former municipal brush dump on Warner Hill Road is also recommended.

    - Management of the Colrain Brush landfill/Former Town Dump including; performing additional field investigation to assess environmental risk, identifying and characterizing the extent of any impacts that may be present, and determining the need for corrective action. The report identified significant quantities of exposed refuse within 50 feet of the North River and groundwater seeps hydraulically connected to the North River as major issues of concern.

    - Management of the Buckland Wood and Demolition Landfill, additional field investigation is recommended to further assess the environmental risk posed by the landfill, identify and characterize the extent of any impacts that may be present, and determine the need for corrective/remedial action. The investigation should include field measurement of hydraulic conductivity, depth to groundwater, confirmation of groundwater flow rate and direction, and collection of upgradient and downgradient groundwater samples and additional seep samples.

    - Management of the Lampson & Goodnow site, additional investigation is recommended to address potential contamination associated with the former process wastewater discharge and identified waste disposal area behind the manufacturing building. The vertical and lateral extent of impacted soils in the area should be delineated, and remedial alternatives should be identified. Additional inspection and sampling of the historical waste disposal area is also recommended to further identify the nature and extent of the waste.

- Management of the former Conway/Buckland Landfill, additional field investigation is recommended to further assess the environmental risk posed by the landfill, identify and characterize the extent of any impacts that may be present, and determine the need for corrective action. Field measurement of hydraulic conductivity, depth to groundwater, confirmation of groundwater flow rate and direction, and collection of upgradient and downgradient groundwater samples and additional seep sampling should be performed.

- Management of the Greenfield tire pile, the tire pile should be removed and the ravine should be stabilized to reduce the potential for erosion and sedimentation in the Deerfield River. This effort should be coordinated with the Greenfield Board of Health and the property owner.

- Monitor compliance and provide input on NPDES permit renewals within the watershed. Conduct site visits to the 5 sanitary wastewater facilities that discharge to the mainstem to discuss permit compliance issues in preparation for 5 year permit renewal (MDEP 2003a).

- Continue garbage and debris removal efforts at illegal dumping areas within the watershed. Priority areas include lower Bozrah Brook, the Green River in Colrain along the eastern side of Green River Road, and areas along the Green River between Swimming Pool Dam and the confluence with the Deerfield River (MDEP 2003a).

- Implement vehicle removal from riparian areas, electric switch removal, and stormwater best management practice to reduce pollution from automobile junkyards within the watershed. Priority areas identified include a site at the mouth of Davis Mine Brook in Charlemont, Massachusetts, as well as along the Green River in Guilford, Vermont, where some efforts are currently underway.

- Remove unused railroad ties that have been discarded along portions of the railroad corridor, which travels from Deerfield to Florida, Massachusetts.

- Petition for additional funding within the state budget to provide environmental police enforcement to prevent illegal garbage dumping within the watershed.

- Complete a water quality assessment of ground and surface water at the East Deerfield Rail Yard and WTE recycling plant to characterize the condition of these sites and develop remediation recommendations if necessary. Priority concerns are related to potential contamination of surface and groundwater resources from documented historic practices as well as currently unmanaged stormwater runoff from these sites (MDEP 2003a).

- Use the upcoming MDEP 604(b) funded Non-point Source Pollution Assessment study to assess potential non-point sources of pollution. This assessment would provide important information to develop implementation projects that would address localized water quality problems. Priority areas for assessment that should be considered as part of this assessment and any future investigations include urban stormwater runoff from local communities, faulty private septic fields in Charlemont and along the North River, faulty municipal sewage infrastructure in along the Green River in Greenfield, industrial stormwater runoff from the East Deerfield Rail Yard and the WTE recycling plant in Deerfield, road salt and herbicide application along transportation corridors, agricultural runoff, and railroad tie disposal areas along the railway corridor.

- Ensure that on-site septic systems are properly sited, maintained and inspected (MDEP 2003a).

- Complete TMDL studies for the waterbodies (Table 2.2-1) listed as category 5 under the Massachusetts Year 2002 Integrated List of Waters (MDEP 2003b).

- Work together to monitor the water quality of the Glen Brook Sub-watershed, an Outstanding Resource Water, to protect current and potential future water supplies (FRCOG 2004).

- Seek grant funding to pay for more detailed hydrologic studies of major groundwater aquifers in the watershed (Figure 2.2-2) to inform land planning, land protection, water quality monitoring, and zoning strategies to conserve groundwater quality (FRCOG 2004).

- Complete demonstration projects and training workshops to local communities related to unpaved road best management practices. Efforts should focus on hands-on training and planning guidance to maintain unpaved roads within the economic constraints imposed by local DPW budgets. This outreach should be focused on local DPWs, selectboards, and conservation commissions. Components should also include distribution of the *Massachusetts Unpaved Roads BMP Manual: A Guidebook on How to Improve Water Quality While Addressing Common Problems* produced by the Berkshire Regional Planning Commission (BRPC), as well as cost estimates and recommendations for potential best management practices. Coordinate activities with appropriate officials in the Vermont portion of the watershed (MDEP 2003a).

- Assist local communities to further develop stormwater management guidelines, issues, and best management practices for urbanized areas. Priorities should include the development of Stream Teams to inventory stormwater outfalls as a part of a process to help the communities manage stormwater. Public outreach and education for residents about stormwater impacts through activities such as storm drain stenciling. The Town of Greenfield currently has some stormwater regulations in place, which are administered by the town department of public works through a stormwater connection permit (MDEP 2003a).

- Assist the Town of Greenfield in monitoring bacteria levels in Maple Brook, a tributary to the Green River, to determine the effectiveness of planned municipal sewer line repairs. In the fall of 2004, the Town of Greenfield is scheduled to repair leaking sewer lines, which historically contributed to bacteria contamination in this tributary. In addition, water quality monitoring should occur in Arms Brook (also a tributary to the Green River) where agricultural activities resulted in elevated bacteria levels (MDEP 2003a).

- Complete a streambank erosion assessment and determine the feasibility of potential stabilization measures along Taylor Brook near its confluence with the West Branch North River, as well as the South River and one its tributaries-Pumpkin Hollow Brook. The Franklin Conservation District has requested funding for FY 2005 for the NRCS Northeast Regional Interdisciplinary Team to complete an assessment of streambank erosion on West Branch of the North River.

- Support the recommendations from the East Branch of the North River geomorphology and streambank stabilization study which commenced in May 2004. This study, which is being conducted by NRCS Northeast Regional Interdisciplinary Team, is investigating erosion and sedimentation issues along the East Branch of the North River. Coordinate activities with appropriate agency officials in the Vermont portion of the watershed.

- Coordinate with appropriate officials in the Vermont portion of the watershed to investigate streambank erosion and sedimentation concerns in the North Branch Deerfield River. A section of

the North Branch and a tributary (Beaver Brook) were assigned a "Non-Support" status by the State of Vermont due to stream channelization and erosion concerns (VANR 2003).

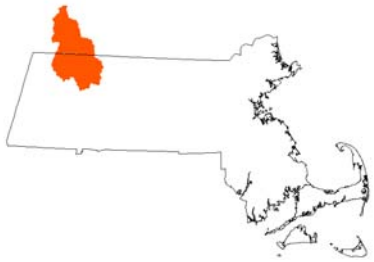
- Work with the proposed Town Agricultural Commissions (FRCOG 2004) to protect riparian buffers and encourage use of agricultural best management practices on a site-specific basis. Priority areas include Clesson Brook, the East and West Branch North River, and Foundry Brook.

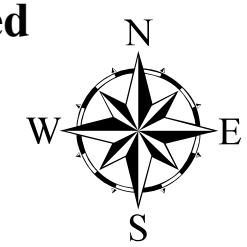
- Facilitate a meeting between local town boards of health and owners of the railroad to discuss concerns related to hazardous waste spill prevention and clean-up measures.

- Support recommendations from the University of Massachusetts, Department of Geosciences study funded for the Davis Mine site (expected in 2004/2005). This effort will include cooperation with UMass, the land owner, MDEP, and other stakeholders to determine the best course of action to remediate the acid mine drainage and restore Davis Mine Brook (MDEP 2003a).

- Implement an education program for boaters. Education materials should be developed to inform boaters about the potential adverse impacts of boats on wildlife and habitat as well as preventing the spread of invasive species by properly cleaning boats. Outreach should consist of posting signs and distributing informational brochures. Coordinate activities with appropriate agency officials in the Vermont portion of the watershed.

Figure 2.2-1: Priority Landfills within the Deerfield River Watershed





MONROE
ROWE
HEATH
FLORIDA
NORTH ADAMS
ADAMS
CHARLEMONT
COLRAIN
LEYDEN
BERNARDSTON
SAVOY
HAWLEY
BUCKLAND
SHELBURNE
GREENFIELD
PLAINFIELD
ASHFIELD
CONWAY
DEERFIELD
GOSHEN

Rowe Landfill
Charlemont Landfill
Colrain Brush Landfill
Lampson & Goodnow
Buckland Wood and Demolition Landfill
Former Conway/Buckland Landfill
Greenfield Tire Pile

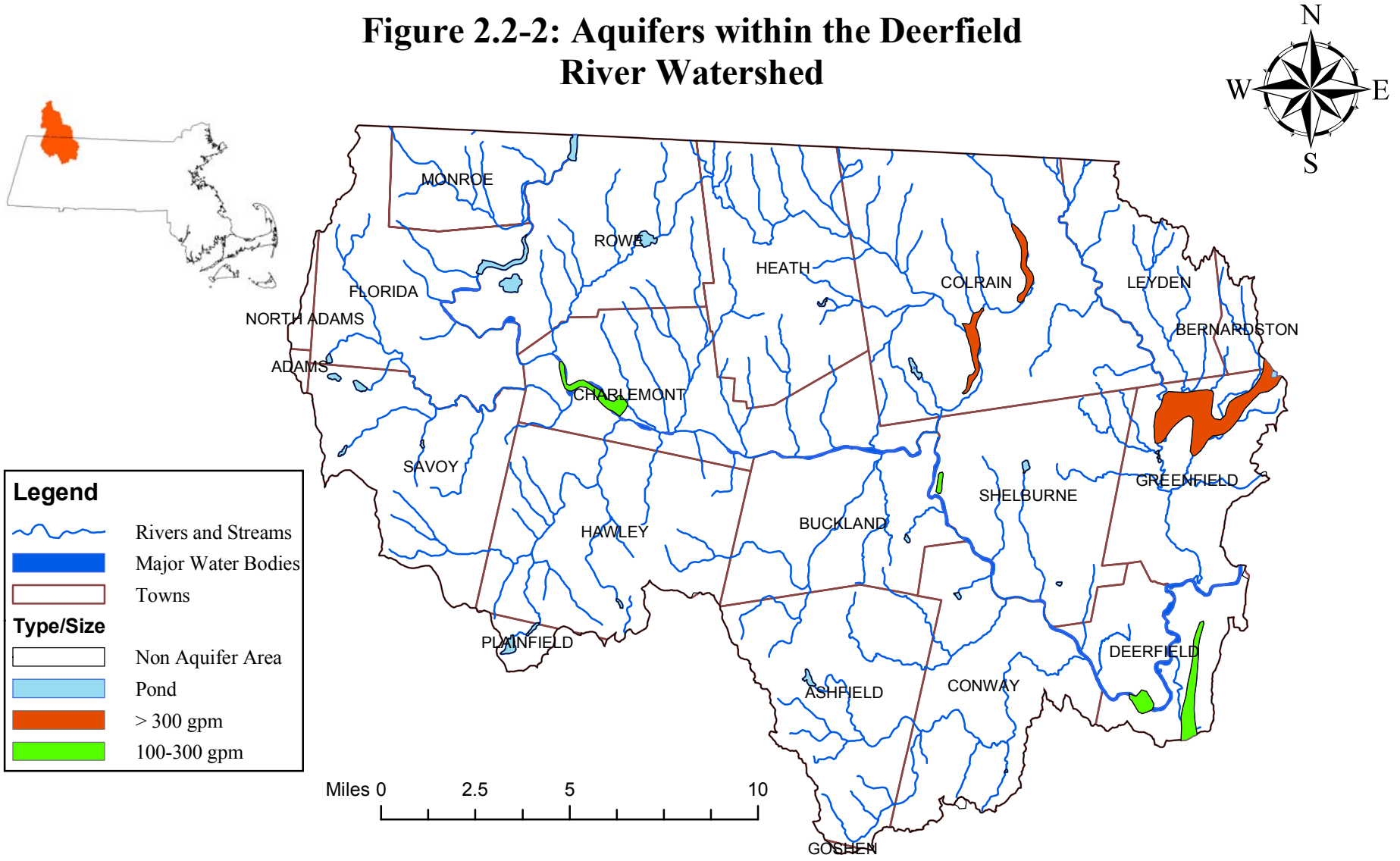
Legend

- Landfills
- Rivers and Streams
- Towns
- Major Water Bodies

Miles 0 2.5 5 10

Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Figure 2.2-2: Aquifers within the Deerfield River Watershed



Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

2.3 Goal: Restore and Improve Stream Continuity and Aquatic Habitat

2.3.1 Key Assessment Findings

The Deerfield River Watershed supports a variety of coldwater and warmwater fish species, which include native, introduced, and stocked populations. There are numerous productive angling locations in the watershed, including a valuable catch and release area located on the mainstem Deerfield River. This area includes the reaches from Fife Brook Dam to Hoosac Tunnel and from Pelham Brook to the Mohawk Campground, which are typically stocked with rainbow and brown trout.

The Natural Heritage and Endangered Species Program (NHESP) recently completed the "Living Waters" project. The results of the project were the delineation of Living Waters core habitats and critical supporting watersheds. Core Habitats either represent the lakes, ponds, rivers, and streams that provide habitat for rare freshwater species, or overall exemplary aquatic habitats. Several Living Waters core habitat areas were identified within the Deerfield River Watershed, including several mainstem reaches and tributaries (Figure 2.3-1). Significant portions of the Cold River, Pelham Brook, Chickley River, Clesson Brook, North, South, and Green Rivers and their subtributaries were identified as core habitats. In addition, significant portions of the mainstem Deerfield between the Fife Brook and Station No. 4 dams were delineated as core habitats, as well as portions of the Deerfield below Station No. 2 Dam, and its mouth.

Historically, several fish species, including Atlantic salmon, blueback herring, American shad, and American eel, sea lamprey, migrated into the Connecticut River Basin to utilize its mainstem fish habitat, as well as the fish habitat within its many tributaries, including the Deerfield River. Damming, pollution, and other alterations caused large declines in fish returns. Efforts continue to restore migratory fish runs to the Connecticut River Basin, including the Deerfield River and its tributaries. On the mainstem Deerfield River, upstream fish migration to Shelburne Falls, Massachusetts is currently blocked by the Station No. 2 Dam. Downstream fish passage is currently provided at the Station No. 4, 3, 2 and Gardners Falls Dams.

The Massachusetts Division of Fisheries and Game (MDFG) currently stocks Atlantic salmon fry in several of the Deerfield River tributaries. Under the terms of USGen's license for the Deerfield River Hydroelectric Project, there are two possible triggers that could initiate construction of permanent upstream fish passage at Station No. 2. One trigger includes documentation of four returning Atlantic salmon in the Station No. 2 tailwaters over two consecutive years. The other trigger includes documentation of 12 returning Atlantic salmon at Station No. 2 for two consecutive years with successful trapping of those fish for transport upriver or to a hatchery (USGen 2002). To date, these triggers have not been met.

In addition, other major dams are located on the North, South, and Green rivers. Specifically, they include the BBA Nonwovens dam on the North River; the Shelburne Falls Road and Conway Electric (owned by the MDCR) dams on the South River; and the Greenfield Water Supply, Swimming Pool, Mill Street, and Wiley & Russell dams located on the Green River. None of these dams have provisions for fish passage.

In 2000 the US Army Corps of Engineers (COE) began a feasibility study of the four dams on the Green River with matching funds provided by the EOEA, DRWT, and the Town of Greenfield. The purpose of the study was to investigate the hydrologic, environmental, physical, cultural, and economic impacts of dam removal and/or fish passage structures at these dams as well as other potential stream ecosystem restoration activities. Recommendations are expected to include dam removal and/or fish passage

structures at Wiley Russell Dam and Mill Street Dam and fish passage structures at Swimming Pool Dam and the Water Supply Dam.

In addition to dams, other barriers to fish passage likely occur within the watershed. These barriers include culverts and bridges, often referred to as stream crossings. Culverts and bridges can become complete barriers to fish and wildlife passage where flow depths are low or velocities are artificially high, openings are small, embankments are high and steep, or the downstream end of a culvert pipe is "perched" above the stream bottom. A comprehensive inventory of these types of obstructions to fish and wildlife passage and movement does not currently exist.

The 1997 FERC relicensing settlement agreement established minimum flows in 12 miles of river that were previously bypassed. However, the effects of fluctuating water levels created by hydropeaking on fish communities and other stream biota in the river continue to be a concern. Rapid changes in flow caused by hydroelectric power generation create unstable habitats that can reduce the abundance and diversity of riverine fish. Changes in water levels displace shallow shoreline zones, forcing fish in those areas to relocate, stranding fish, or exposing trapped fish to predation. Flow fluctuations can also degrade the quality of shoreline habitat by altering macroinvertebrate communities, aquatic and riparian vegetation, and availability of structure such as woody debris.

2.3.2 Objectives and Priority Actions

The following objectives and priority actions focus on the goal of restoring and improving stream continuity and aquatic habitat in the Deerfield River Watershed.

Objectives

- Improve fish passage and wildlife movement within tributaries of the Deerfield River.

- Investigate aquatic habitat conditions and biotic diversity in the Deerfield River mainstem.

Priority Actions

- Participate in the Mass Riverways river continuity partnership, which is a cooperative effort with UMASS Extension, the Massachusetts Watershed Initiative, the Pioneer Valley Chapter of Trout Unlimited, and the MassHighway Department. This effort has created protocols and training materials for volunteer assessment and inventory of culverts and other road crossings, and developed performance standards for use by local and state managers and regulators to avoid, minimize, or mitigate the impacts of these barriers. This project will be valuable in developing a watershed-wide strategy for the removal of barriers to fish and wildlife movement in and along river and stream corridors. Initial surveys should be completed to assess river continuity on the Deerfield River's tributaries. The surveys should be used to identify priority sites and potential projects to reduce the impacts posed by existing highway and culvert infrastructure.

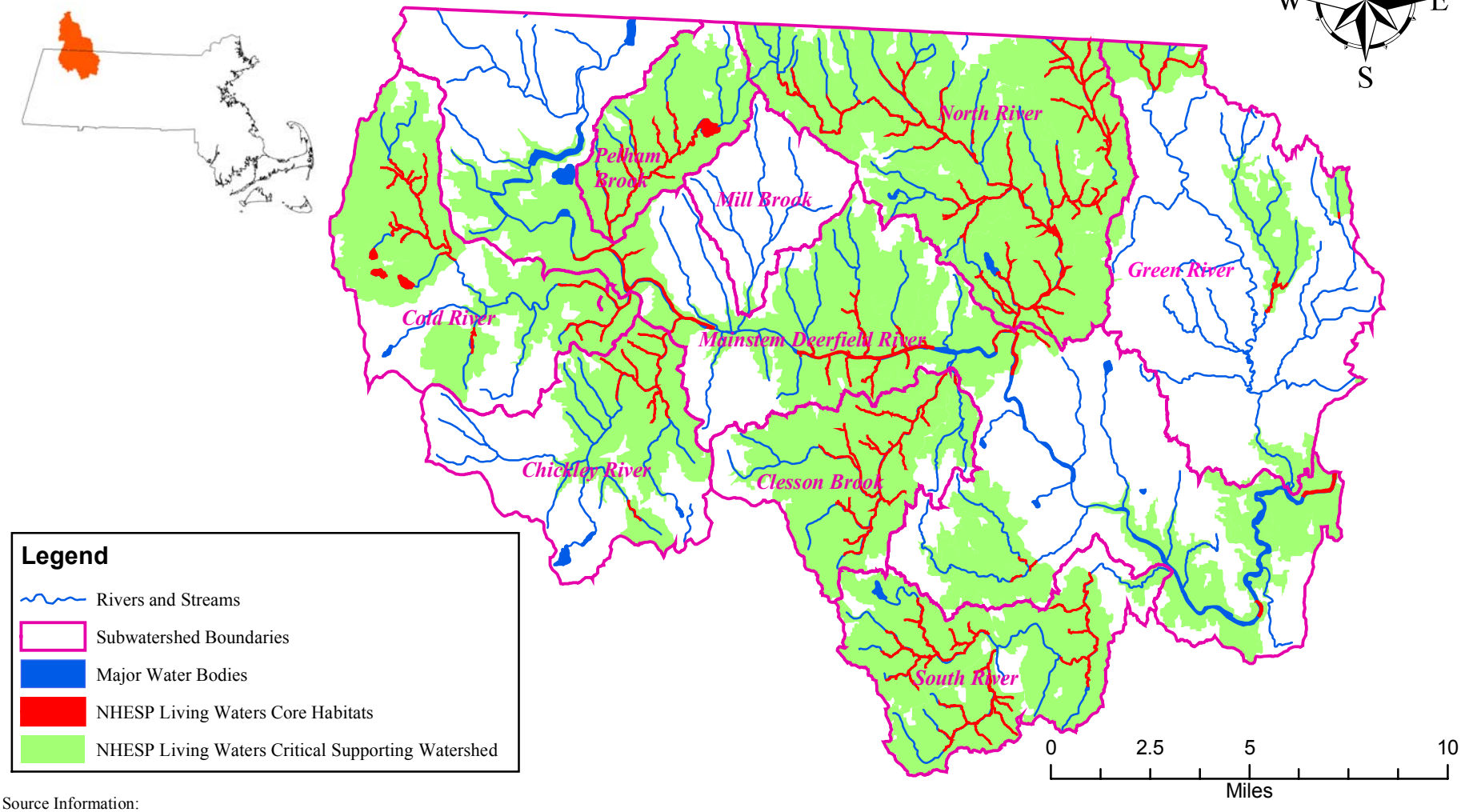
- Support the recommendations from the COE feasibility study and assist the Town of Greenfield in securing funding for dam removal and/or fish passage structures at Wiley Russell Dam and Mill Street Dam and fish passage structures at Swimming Pool Dam and the Water Supply Dam. The feasibility study is expected to be completed in 2005. Implementation of the recommendations is optional; however the Town of Greenfield may request funding from COE for up to 70% of the cost if the recommendations are adopted (MDEP 2003a).

- Assist BBA Nonwovens in partnering with the Massachusetts Riverways Program and other entities to develop engineering design and acquire funding to construct a natural fish passage at the BBA Nonwovens Dam near the confluence of West Branch North River and North River. A proposed plan would consist of a channel realignment and reconstruction project at the site to allow unimpeded fish and wildlife movement through the river reach.

- Work with the Massachusetts Riverways Program to complete an inventory of dams within the watershed that no longer serve any useful purpose. Priority dams should be identified for removal based on expected environmental benefits, potential for project partnering, and availability of funding sources. Feasibility studies should be undertaken at these priority sites to determine if removal is viable (MDEP 2003a).

- Complete fish and aquatic macroinvertebrate surveys along portions of the mainstem Deerfield River to determine diversity and abundance, as well as overall habitat quality. Priority areas would include hydroelectric dam bypass reaches, as well as locations directly below hydroelectric projects that may be impacted by frequent fluctuating water levels created by hydropeaking.

Figure 2.3-1: NHESP Living Waters Core Habitats and Critical Supporting Watersheds in the Massachusetts Portion of the Deerfield River Watershed



Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

2.4 Goal: Protect Wetlands and Promote Terrestrial Habitat Diversity

2.4.1 Key Assessment Findings

The NHESP completed the BioMap project to identify areas in need of protection in order to preserve native biodiversity. Maps were developed to delineate the most viable rare species habitats and natural communities (i.e., core habitat), as well as large minimally-fragmented supporting natural landscapes that protect the core habitats. There are several significant concentrations of core habitats and supporting natural landscapes in the Deerfield River Watershed (Figure 2.4-1). Every town in the watershed has portions of a BioMap core habitat within it.

Approximately 83% of the Deerfield River Watershed is covered by forest. It has been estimated that up to one-quarter of this forestland is owned by agricultural interests, and managed/farmed for forest products such as timber, maple syrup, mushrooms, fiddleheads, and other non-timber products.

Within Massachusetts, in 1985 trees sizes were distributed more evenly across the sawtimber[3] and poletimber[4] classifications. Sawtimber stands covered 41%, while poletimber stands accounted for 51%. Seedling/sapling[5] stands accounted for 8%. Relative to the 1998 inventory data, this represented a 51% decrease in poletimber stands while sawtimber stands increased by 48% (USDA 1998). This statewide trend is most likely exhibited within the Deerfield River Watershed as well. The trend is indicative of overall forest maturation, and a corresponding loss in early-successional forests (e.g., abandoned fields, grasslands, and shrublands) (MDFW 2004).

Populations of many bird species that prefer early-successional habitats have declined in recent times. Overall, 12 of 16 shrubland birds exhibited declining populations, including golden-winged warbler (endangered in Massachusetts), prairie warbler, and field sparrow, whose populations decreased by more than 2% annually. Other shrubland birds such as ruffed grouse and woodcock have declined by approximately 4% annually. In addition, five of six birds commonly associated with grasslands exhibited dramatic declines. Three of these species, the upland sandpiper, vesper sparrow, and grasshopper sparrow, are either threatened or endangered in Massachusetts (MDFW 2004).

Recent studies identified the presence of American and least bittern, which are endangered marshbird species in Massachusetts, within several wetlands in the watershed (DRWA 2003a). Also, vernal pool habitat is extremely important to a variety of wildlife species including some amphibians that breed exclusively in vernal pools, and other organisms, which spend their entire life cycles confined to vernal pool habitat. There are 11 vernal pools (Figure 2.4-2) certified by the NHESP within the Massachusetts portion of the watershed. Certified vernal pools are offered protections under the state wetlands protection act regulations, as well as the state water quality certification, state Title 5, and forest cutting practices act regulations. NHESP also identified the locations of over 450 potential vernal pools (Figure 2.4-2). Potential vernal pools do not receive protection under state wetlands protection act regulations, or any other state or federal wetlands protection laws. For a vernal pool to be officially certified, specific information must be collected in the field and presented to the NHESP.

[3] Sawtimber sized trees are defined as trees containing at least one 12-foot saw log or two noncontiguous saw logs, each at least 8 feet long. Softwoods must be a least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.
[4] Poletimber sized trees are at least 5.0 inches in diameter at breast height and smaller than sawtimber size.
[5] Seedlings/saplings are trees less than 5.0 inches in diameter at breast height.

Japanese knotweed has become the most visible and established invasive terrestrial plant in the watershed. Large stands of knotweed can be observed along the mainstem Deerfield River covering riparian areas and mid-channel islands from above Zoar Gap in Florida and Rowe, Massachusetts to below the Stillwater area in Deerfield, Massachusetts. In addition, detailed surveys of eight tributaries revealed areas of extensive Japanese knotweed infestation. Clesson Brook and the Chickley, Green, and South rivers have the most severe infestations of Japanese knotweed, while Avery Brook and Bear River have a moderate level of infestation. Tannery and Sanders Brook have little or no infestation (DRWA 2003b). Japanese knotweed, as well as other invasive species, threatens the biodiversity of riverine communities by replacing important natural plant communities and wildlife habitat.

Black bear populations in the Massachusetts portion of the watershed are relatively extensive. The watershed typically ranks among the highest in terms of annual bear harvest in Massachusetts. Black bear were hunted to near extirpation in the nineteenth century; however changes in land use and a reduction in hunting pressure have increased bear populations. Currently the population is increasing at approximately 8 to 10% annually and is expanding eastward into more densely populated areas (MDFW 2000).

2.4.2 Objectives and Priority Actions

The following objectives and priority actions focus on the goal of protecting wetlands and promoting terrestrial habitat diversity in the Deerfield River Watershed.

Objectives

- Enhance terrestrial habitat diversity via appropriate forest and land management practices
- Protect potential vernal pool locations within the watershed, as well as other wetlands areas
- Control the infestation and spread of invasive terrestrial plant species such as Japanese knotweed
- Reduce unwanted human/bear interaction

Priority Actions

- Collaborate to conserve a shared 10,000-acre contiguous block of forest in Charlemont and Heath (FRCOG 2004).
- Collaborate to conserve forests within shared BioMap Core Habitat areas using a multitude of strategies from forest management promotion to the use of conservation restrictions. Identify open spaces that provide wildlife habitat including the Core Habitat and Living Waters habitats, determine their level of threat from development, and encourage landowners to protect the land or to manage the land for the species. (FRCOG 2004).
- Promote the use of sustainable forest management practices to conserve biodiversity. Sustainable forestry practices can provide early successional forest habitat while addressing increasing demands for wood products and biodiversity conservation. Overall, forest management should focus on maintaining diverse forest stands in terms of trees species and forest stages.
- Develop a forest management committee, comprised of local foresters and natural resource professionals, to meet with local conservation commissions to ensure they have at their disposal

appropriate background knowledge, information and resources to complete a thorough review of future forest cutting plans in the watershed.

- Petition for increased funding for enforcement and review of forest cutting operations, and a review and changes, if necessary, to the current forest cutting regulations, particularly related to the minimum logging area required for filing a cutting plan.

- Promote the Grassland Reserve Program as a means of restoring and protecting grasslands. The program is voluntary and helps landowners and operators restore and protect grassland habitat, including rangeland, and pastureland, and certain other lands, while maintaining the areas as grazing lands.

- Protect potential vernal pools locations by utilizing volunteers to complete the NHESP certification process. In Massachusetts, vernal pools are certified by the NHESP based on documentation by citizens. Documentation for vernal pool certification has three components: completion of an observation form, mapping that precisely locates the vernal pool and evidence for the presence of the vernal pool itself and its use by the indicator species. Volunteer groups such as Stream Teams can be trained through educational workshops held by wetlands experts, knowledgeable in the certification process.

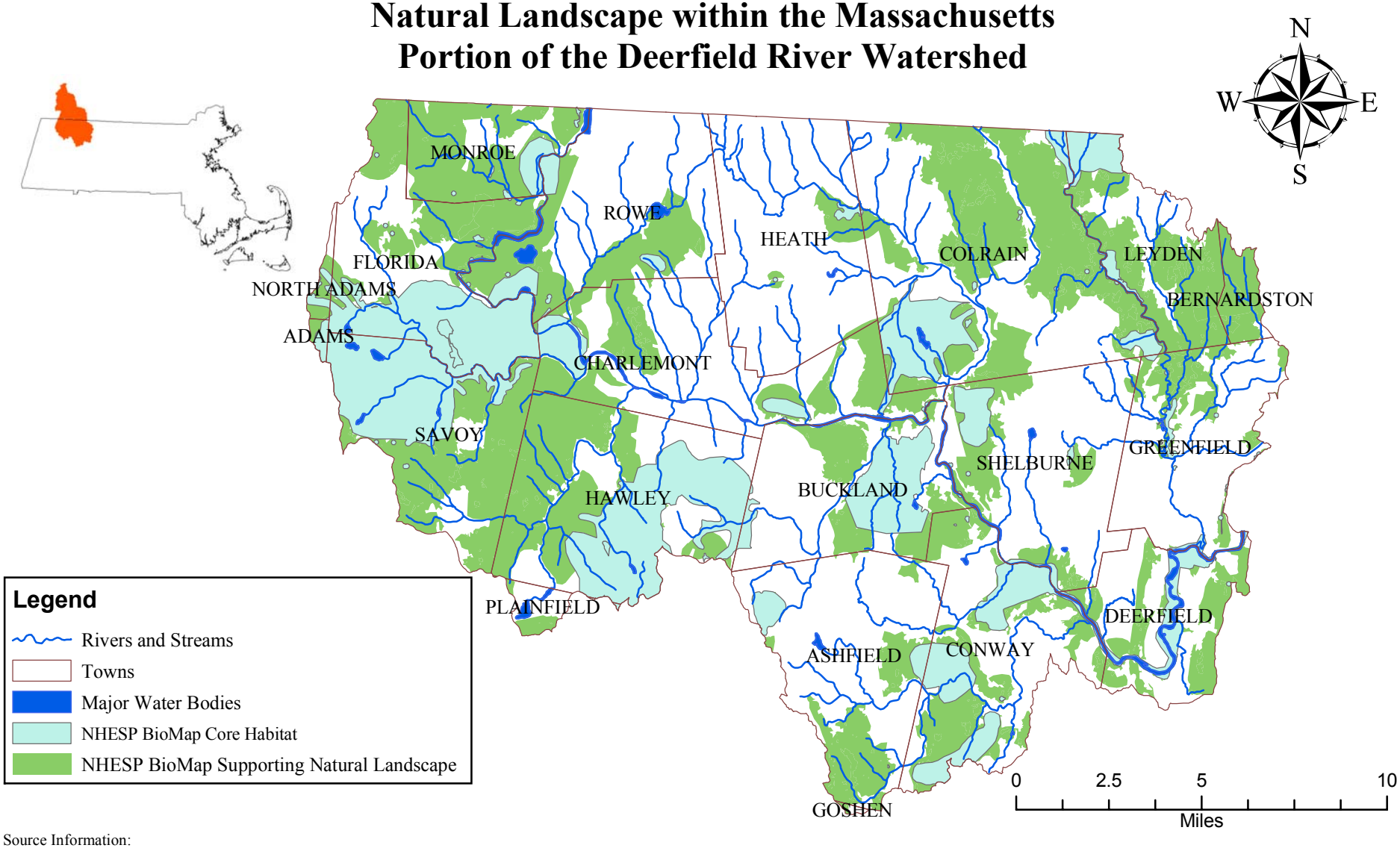
- Conduct public outreach and education activities with local conservation commissions and landowners with respect to the wetlands protection act. Outreach activities should stress the importance of protecting vernal pools and other wetland areas, as well as an understanding of agricultural exemptions afforded under the act.

- Conduct follow-up marshbird and calling amphibian surveys of select wetlands within the watershed.

- Pursue efforts to control the invasive plant species Japanese knotweed along the mainstem Deerfield River and its tributaries. Priority areas within the watershed have been identified through previous study. Removal demonstration projects at the top priority sites should be completed, using techniques based on current research, site constraints, and recommendations from experts in the field. Monitoring strategies to evaluate effectiveness of the selected technique(s) should be developed and implemented as well.

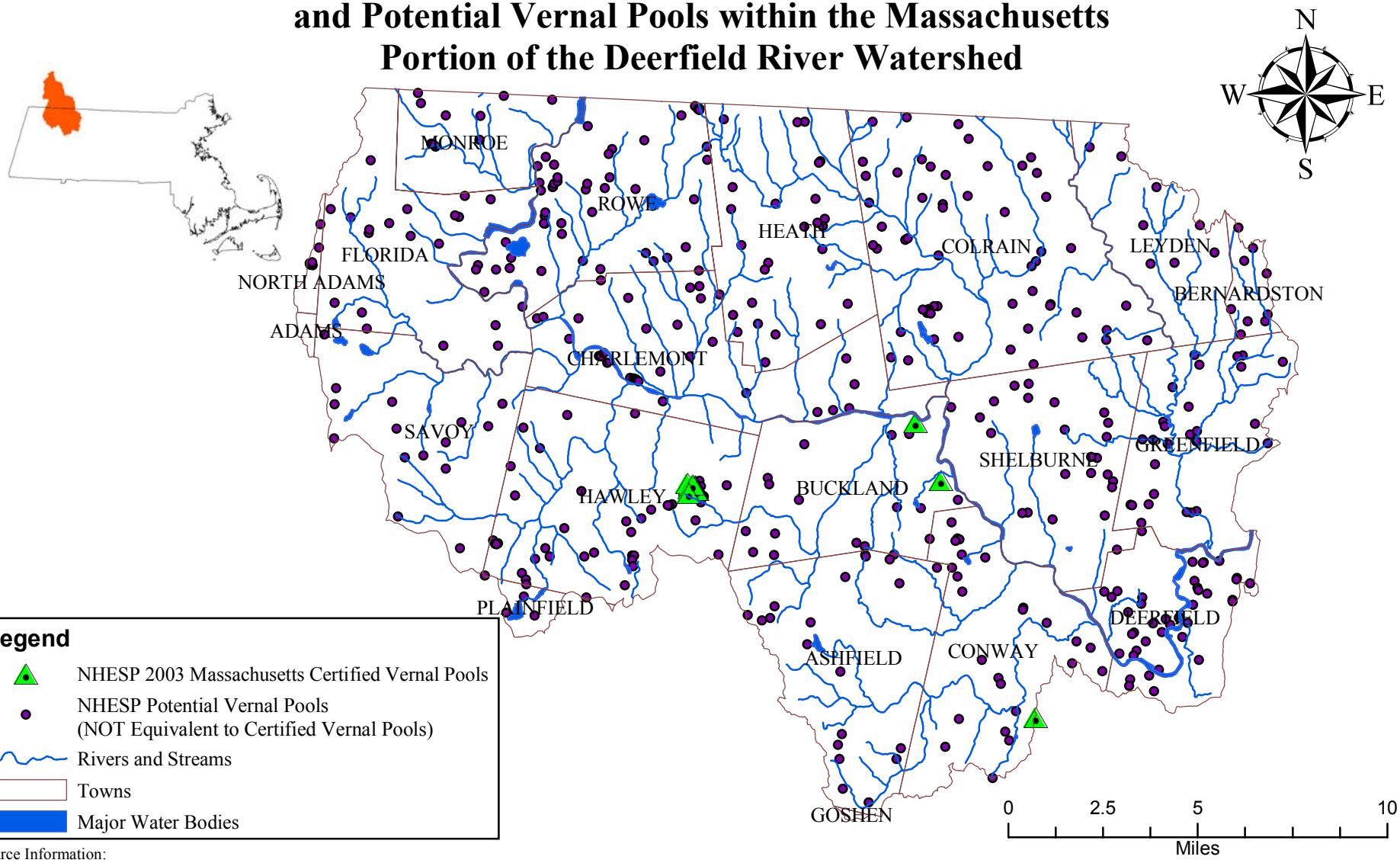
- Conduct a public outreach and education campaign to apprise landowners of measures to reduce nuisance bear encounters.

Figure 2.4-1: NHESP BioMap Core Habitat and Supporting Natural Landscape within the Massachusetts Portion of the Deerfield River Watershed



Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Figure 2.4-2: NHESP 2003 Massachusetts Certified and Potential Vernal Pools within the Massachusetts Portion of the Deerfield River Watershed



Source Information:
- Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

2.5 Goal: Provide Safe Recreation and Public Access/Use

2.5.1 Key Assessment Findings

The Deerfield River is one of the most heavily used recreational rivers in the New England Region, with the most favored activities being whitewater boating and angling (FERC 1997). Several commercial whitewater outfitters offer raft, canoe, and kayak trips within the watershed. Individual recreational users are also attracted to the area for tubing, rafting, canoeing and kayaking, although kayak trips are somewhat more common (USGen 2000). Other activities within the watershed include hiking, downhill skiing, cross-country skiing, camping, picnicking, swimming, snowmobiling, off-highway recreational vehicles, foliage and wildlife viewing, and hunting.

Due to its proximity to population centers and the predictability of its flows, the Deerfield River is one of the premier whitewater boating locations in the region. Whitewater boating has developed steadily along the river due to high flows provided at several hydroelectric dams currently owned by USGen. In addition, scheduled flow releases suitable for whitewater boating are provided at the Station No. 5 and Fife Brook dams.

However, the popularity of whitewater boating and tubing has attracted an increasing number of river users, some of whom frequently lack discretion and knowledge about the power of the river and the level of skills required to recreate on whitewater. As a result, injuries and rescues occur often. Overall, individuals and groups who promote, manage and participate in river recreation along the Deerfield River have expressed several concerns. These concerns include the prevalence of alcohol consumption, lack of safety equipment, unpredictable water level changes, littering, and trespassing.

One of the more prominent trails in the watershed is the Mahican-Mohawk Trail, a former Native American trail linking the Hudson and Connecticut River Watersheds. This original trail is currently being reestablished as a recreational trail within the Deerfield River Watershed. In addition, there is a vast network of trails throughout the watershed and particularly within the state forest lands. These trails, which are maintained by various recreational user groups, offer opportunities for hiking, horseback riding, cross-country skiing, snowmobiling, and in some cases ORV use. Trail building, proper use and stewardship, and maintenance continue to be a high priority within the watershed.

2.5.2 Objectives and Priority Actions

The following objectives and priority actions focus on the goal of providing safe recreation and public access/use in the Deerfield River Watershed.

Objectives

- Promote recreational boating safety in the watershed.
- Reduce negative impacts (i.e., littering, trespassing) associated with increased recreational use.
- Expand public river access sites along the mainstem Deerfield for recreational users.
- Promote and provide access to existing and new recreational trail networks on public and private lands in the watershed (e.g. walking, hiking, bicycle, snowmobile, canoe, raft, and kayak trails, paths, lanes, and water trails for hunting, hiking, fishing, snowmobiling, horseback riding, cross-country

skiing, swimming, bird watching, Off-Highway Vehicles, bicycling, mountain biking, canoeing, kayaking, rafting, etc.) (FRCOG 2004).

Priority Actions

- Initiate a river safety and education campaign that will enhance the safety of all river users. A River Safety Advisory Committee that includes representatives from the DRWT, volunteer fire rescue departments, police departments, the Massachusetts Environmental Police, rafting companies, paddlers, tubers, USGen, and other interested parties should be formed.

- Promote increased river safety patrols by Massachusetts Environmental Police Officers particularly during predicted high use times, and petition for additional funding within state budget. Ideally, patrols should occur throughout the summer months during weekends and holidays as they are the times of highest use. In addition, one safety patrol randomly scheduled during each summer week should be conducted to promote river safety to those river users not typically restricted to weekends and holidays.

- Adopt enforceable regulations for private parking and picnic grounds owned by USGen and others, which are located along the mainstem Deerfield River. Currently, the environmental police have no jurisdiction to enforce USGen's regulations at these facilities. The proposed River Safety Advisory Committee should lead efforts to develop a cooperative enforcement plan between private landowners and state regulators for these areas.

- Support passage of House Bill #590, which would institute penalties and allow enforcement of alcohol possession on Massachusetts waterways, including the mainstem Deerfield River. Currently, state regulations prohibit alcohol possession on several reaches of the Deerfield River; however, there is no penalty clause associated with the regulation.

- Promote increased patrols and enforcement by Massachusetts Environmental Police Officers of off-road vehicle use within restricted areas at state forests.

- Develop a fund and process to compensate landowners (i.e., farmers and others) for property damages resulting from uncontrolled passage to lands identified as public resources (i.e., water bodies, access points to trails).

- Investigate the feasibility of additional river access points along the mainstem Deerfield River. Potential boat access sites should include an area along River Road below Fife Brook Dam, which would decrease the distance between current access points; allowing users an option for shorter river trips. In addition, a river access point near the junction of Route 5 and 10 in Greenfield would be desirable. A recreational bridge across the Deerfield River in the Charlemont/Buckland area linking existing or proposed trails would be a priority as well. Adjacent landowners should have input in the planning and design of any proposed facilities.

- Continue annual volunteer river clean-ups of river access points by DRWA, Zoar Outdoor and Trout Unlimited (MDEP 2003a).

- Collaborate to develop the Green River Greenway for both habitat protection and a recreational trail (FRCOG 2004).

- Investigate the feasibility of a watershed boundary ridge trail that could be extended into Vermont that would also link village areas to parks, facilities, state forests, wildlife management areas, and town conservation areas (FRCOG 2004).

- Hold a regional conference to focus on discussions of recreational trail use issues (e.g. ORV use on sensitive areas) in Western Massachusetts and on the short and long-term solutions (FRCOG 2004).

2.6 Protect Open Space and Maintain Rural Landscape

2.6.1 Key Assessment Findings

The majority of the watershed is heavily forested with farmland typifying the eastern portion. Overall, land use in the watershed consists of approximately 83% forest, 7% agriculture, and 4% residential. It has been estimated that one-quarter of the open land and forests are owned by farmers.

Development has been documented in distinct areas of the watershed, particularly in the towns of Greenfield and Shelburne. Industrial development is common along major rivers and commercial development in village centers and along the Mohawk Trail. Large residential subdivisions are uncommon in the watershed (FRCOG 2004).

Since 1985, there have been significant changes in land use within the Massachusetts portion of the watershed. Specifically, large lot residential development has resulted in the loss of forest and farmland. Between 1985 and 1999, the watershed experienced reductions in cropland (10%), pastureland (22%), and forest (1%), with a 58% increase in large-lot residential development (FRCOG 2004).

Communities use a variety of planning tools including local by-laws and ordinances to control or otherwise guide growth. The most widespread zoning district in the watershed is the Residential-Agricultural designation. Buckland, Colrain, Deerfield, Greenfield, and Shelburne have commercial districts. Industrial zones are delineated in Buckland, Colrain, Conway, Deerfield, Greenfield, Rowe, and Shelburne.

As mentioned previously, FRCOG recently completed an effort to develop an open space and recreation plan for the Deerfield River Watershed (FRCOG 2004). The plan contained several actions to protect open space and manage community growth, without losing valued characteristics of the watershed. Several of those actions are reiterated below, and readers are encouraged to review the FRCOG plan for additional details.

2.6.2 Objectives and Priority Actions

The following objectives and priority actions focus on the goal of protecting open space and maintaining the rural landscape within the Deerfield River Watershed.

Objectives

- Focus new development in the most appropriate areas (FRCOG 2004).
- Encourage land use and development patterns that manage growth and preserve scenic, rural character, open space, and water resources, and agricultural and forested lands (FRCOG 2004).
- Protect and conserve agricultural lands (FRCOG 2004).
- Identify and conserve parcels of conservation, wildlife, and recreation interest (FRCOG 2004).
- Coordinate with state, regional, and local entities to maximize protection of joint open space resources (FRCOG 2004).

Priority Actions

- Develop a model bylaw adaptable by towns that would grant incentives to developers willing to revitalize old buildings rather than develop open space (FRCOG 2004).

- Explore alternative zoning regulations (e.g., riverfront zoning along riparian corridors) to conserve natural, agricultural, and scenic values.

- Collaborate to raise funds for conserving the most important agricultural lands in the watershed (FRCOG 2004).

- Identify and protect parcels of conservation, wildlife, and recreation interest that are most threatened by development (FRCOG 2004).

- Encourage towns to consider passing the Community Preservation Act, or to establish and contribute to their own municipal fund to help purchase and leverage land protection projects (FRCOG 2004).

- Identify the most important unprotected open space parcels adjacent to protected lands (FRCOG 2004).

- Partner with Franklin Land Trust and seek funding from federal, state, and private sources to protect remaining farm and forestland in the watershed as the opportunities arise (FRCOG 2004).

3 ACTION MATRIX

This matrix lists the goals, objectives, and action strategies described in the previous section. In addition, the proposed lead parties for undertaking each action and the timeframe over the next 5 years for implementing each action (e.g., a start date of 2004 would indicate a high priority) are described. Potential funding sources are listed in Section 4. In some cases, the agency or entity proposed as the lead party is likely to be able to conduct the action as part of its operating budget and/or through the use of volunteers.

Action Strategy	Lead Parties	Start Date
Goal: Coordinate Flow Management to Benefit Multiple Uses		
Objective: Maintain predictable flow releases below USGen's hydroelectric facilities on the mainstem Deerfield River to benefit all river users		
Examine streamflow data to quantify the timing, magnitude, and frequency of flow fluctuations.	MDFG, TU	2004
Hold a forum with USGen and other interested parties of the FERC license settlement agreement	DRWA, USGen	2005
Work collaboratively with Representative Daniel Bosley to craft legislation that will result in scheduled and predictable flow releases, which will enhance the use and ecological integrity of the Deerfield River.	TU, DRWA	2004
Goal: Protect and Improve Water Quality in the Watershed		
Objective: Identify and minimize point sources of pollution throughout the watershed		
Facilitate annual joint meetings with neighboring towns' Conservation Commissions and Boards of Health to maintain a cooperative approach to water resource protection and to discuss the potential for collaboration on water quality monitoring and on other non-point source pollution needs (FRCOG 2004).	DRWT and DRWA	2008
Continue water quality monitoring by MDEP and DRWA of the Deerfield mainstem and its tributaries	MDEP and DRWA	2004
Support the reclassification of eligible streams as "Cold Water Fisheries". The reclassification will provide an additional level of protection for streams.	MDFG, TU, DRWA	2006
Monitor compliance and provide input on NPDES permit renewals within the watershed.	EPA, MDEP, DRWA	2006
Objective: Identify and minimize non-point sources of pollution within the watershed		
Implement the recommendations of the Fuss and O'Neill, Inc. (2003) landfill assessment study for the watershed.	MDEP, local towns, DRWA	2005
Continue garbage and debris removal efforts at illegal dumping areas within the watershed.	DRWA, Whitewater rafting companies, local volunteers	2004
Implement vehicle removal from riparian areas, electric switch removal, and stormwater best management practice to reduce pollution from automobile junkyards.	MDEP, Franklin County Solid Waste District, WTE Recycling	2006

Action Strategy	Lead Parties	Start Date
Remove unused railroad ties that have been discarded along portions of the railroad corridor, which travels from Deerfield to Florida, Massachusetts	DRWA, railway owner	2006
Petition for additional funding within the state budget to provide environmental police enforcement to prevent illegal garbage dumping within the watershed.	Massachusetts Environmental Police, DRWA, Whitewater interests, local towns	2004
Complete a water quality assessment of ground and surface water at the East Deerfield Rail Yard and WTE recycling.	MDEP, DRWA	2006
Use the upcoming MDEP 604(b) funded Non-point Source Pollution Assessment study to assess potential non-point sources of pollution.	MDEP, FRCOG, DRWT	2004
Ensure that on-site septic systems are properly sited, maintained and inspected.	Local Boards of Health, MDEP	2004
Complete TMDL studies for the waterbodies (Table 2.2-1) listed as category 5 under the Massachusetts Year 2002 Integrated List of Waters.	MDEP	2007
Work together to monitor the water quality of the Glen Brook Sub-watershed, an Outstanding Resource Water, to protect current and potential future water supplies (FRCOG 2004).	Greenfield Water Department and the Leyden Conservation Commission	2005
Seek grant funding for more detailed hydrologic studies of major groundwater aquifers in the watershed to inform land planning, land protection, water quality monitoring, and zoning strategies to conserve groundwater quality (FRCOG 2004).	FRCOG, Charlemont, Colrain, and Shelburne Town Boards of Health and Community Water Supply Superintendents, and the State Geologist	2005
Complete demonstration projects and training workshops to local communities related to unpaved road best management practices.	DRWA, Stream Teams town DPWs, Conservation Commissions	2004
Assist local communities to further develop stormwater management guidelines, issues, and best management practices.	Local communities, MDEP, DRWA, Stream Teams	2005
Assist the Town of Greenfield in monitoring bacteria levels in Maple Brook, a tributary to the Green River, to determine the effectiveness of planned municipal sewer line repairs. In the fall of 2004, the Town of Greenfield is scheduled to repair leaking sewer lines, which historically contributed to bacteria contamination in this tributary.	Town of Greenfield, MDEP, DRWA	2005
Complete a streambank erosion assessment and determine the feasibility of potential stabilization measures along Taylor Brook, the South River and Pumpkin Hollow Brook.	NRCS, Franklin Conservation District, Colrain and Conway Conservation Commissions, MDAR	2005
Support the recommendations from the East Branch of the .North River geomorphology and streambank stabilization survey, which is being conducted NRCS Northeast Regional Interdisciplinary Team.	NRCS, Franklin Conservation District, DRWA, Colrain Conservation Commission, MDAR	2004
Coordinate with appropriate officials in the Vermont portion of the watershed to investigate streambank erosion and sedimentation concerns in the North Branch Deerfield River.	NRCS, Franklin Conservation District, DRWA	2006

Action Strategy	Lead Parties	Start Date
Work with the proposed Town Agricultural Commissions (FRCOG 2004) to protect riparian buffers and encourage use of site-specific agricultural best management practices.	MDAR, NRCS, Conservation Commissions, local farmers	2007
Facilitate a meeting between local town boards of health and owners of the railroad.	DRWA, local town boards of health	2005
Support recommendations from the University of Massachusetts, Department of Geosciences study funded for the Davis Mine site.	MDEP, DRWA, Rowe and Heath Conservation Commissions	2006
Objective: Control the infestation and spread of invasive aquatic plant species within the watershed		
Implement an education program for boaters. Education materials should be developed to inform boaters about the potential adverse impacts of boats on wildlife and habitat along the river as well as preventing the spread of invasive species by properly cleaning boats.	MDEP, MDFG, DRWT, Stream Teams	2006
Goal: Restore and Improve Stream Continuity and Aquatic Habitat		
Objective: Improve fish passage and wildlife movement within tributaries of the Deerfield River		
Participate in the Mass Riverways river continuity partnership.	DRWA, Conservation Commissions, Stream Teams	2004
Support the recommendations from the COE feasibility study and assist the Town of Greenfield in securing funding for dam removal and/or fish passage structures at Wiley Russell Dam and Mill Street Dam and fish passage structures at Swimming Pool Dam and the Water Supply Dam.	COE, Town of Greenfield, DRWA, Mass Riverways	2005
Assist BBA Nonwovens in partnering with the Massachusetts Riverways Program and other entities to develop engineering design and acquire funding to construct a natural fish passage at the BBA Nonwovens Dam.	BBA Nonwovens, Mass Riverways, TU, MDFG	2005
Work with the Massachusetts Riverways Program to complete an inventory of dams within the watershed that no longer serve any useful purpose, and conduct removal feasibility studies at priority sites.	Mass Riverways, DRWA, TU, MDFG	2006
Objective: Investigate aquatic habitat conditions and biotic diversity in the Deerfield River mainstem.		
Complete fish and macroinvertebrate surveys along portions of the mainstem Deerfield River to determine diversity and abundance, as well as overall habitat quality.	MDFG, USGS, TU	2005
Goal: Protect Wetlands and Promote Terrestrial Habitat Diversity		
Objective: Enhance terrestrial habitat diversity via appropriate forest and land management practices		
Collaborate to conserve a shared 10,000-acre contiguous block of forest in Charlemont and Heath (FRCOG 2004).	Charlemont, Heath & Colrain Open Space Committees (OSC) with support from Town Select Boards, MDCR, MDAR, and FLT	2005

Action Strategy	Lead Parties	Start Date
Collaborate to conserve forests within shared BioMap Core Habitat areas using a multitude of strategies from forest management promotion to the use of conservation restrictions. Identify open spaces that provide wildlife habitat including the Core Habitat and Living Waters habitats, determine their level of threat from development, and encourage landowners to protect the land or to manage the land for the species (FRCOG 2004).	Monroe & Rowe Planning Boards Florida, Savoy, Rowe and Charlemont OSCs Hawley, Ashfield, Buckland OSCs Colrain and Charlemont OSCs Shelburne and Conway OSCs Ashfield and Conway OSCs Deerfield and Conway OSCs Deerfield and Greenfield OSCs Heath and Colrain OSCs Leyden and Colrain OSCs	2006
Promote the use of sustainable forest management practices to conserve biodiversity.	MDCR, DRWA, conservation commissions, MDAR	2005
Develop a forest management committee, comprised of local foresters and natural resource professionals, to ensure that local conservation commissions have at their disposal appropriate background knowledge, information and resources to complete a thorough review of future forest cutting plans in the watershed.	DRWT, MDCR, volunteers	2006
Petition for increased funding for enforcement and review of forest cutting operations, and a review and changes, if necessary, to the current forest cutting regulations.	DRWT, FCD, MDCR, MDAR	2007
Promote the Grassland Reserve Program as a means of restoring and protecting grasslands.	NRCS, DRWA, MDAR	2005
Objective: Protect potential vernal pool locations within the watershed as well as other wetland areas		
Protect potential vernal pools locations by utilizing volunteers to complete the NHESP certification process.	DRWA, Mass Audubon, conservation commissions, NHESP, Stream Teams	2005
Conduct public outreach and education activities with local conservation commissions and landowners with respect to the wetlands protection act.	DRWA, DRWT, local volunteers, Stream Teams	2004
Conduct follow-up marshbirds and calling amphibian survey of select wetlands	DRWA, local volunteers	2007
Objective: Control the infestation and spread of invasive terrestrial plant species such as Japanese knotweed		
Pursue removal demonstration projects and effectiveness monitoring to control the invasive plant species Japanese knotweed along the mainstem Deerfield River and its tributaries.	DRWA, local volunteers, Stream Teams	2005
Objective: Reduce unwanted human/bear interaction		
Conduct a public outreach and education campaign to apprise landowners of measures to reduce nuisance bear encounters	DRWA, local boards of health	2006
Goal: Provide Safe Recreation and Public Access/Use		
Objective: Promote recreational boating safety in the watershed.		

Action Strategy	Lead Parties	Start Date
Initiate a river safety and education campaign that will enhance the safety of all river users. A River Safety Advisory Committee that includes representatives from the DRWT, volunteer fire rescue departments, police departments, environmental police, rafting companies, paddlers, tubers, USGen, and other interested parties should be formed.	Massachusetts Environmental Police, DRWA, DRWT, Whitewater rafting companies, New England FLOW	2005
Promote increased river safety patrols by Massachusetts Environmental Police Officers particularly during predicted high use times, and petition for additional funding within state budget.	DRWT, Massachusetts Environmental Police, Whitewater rafting companies	2004
Objective: Reduce negative impacts (i.e., littering, trespassing) associated with increased recreational use.		
Adopt enforceable regulations for private parking and picnic grounds owned by USGen and others, which are located along the mainstem Deerfield River.	Massachusetts Environmental Police, USGen, DRWT	2006
Continue annual volunteer river clean-ups of river access points.	DRWA, Whitewater interests, TU	2004
Support passage of House Bill #590, which would institute penalties and allow enforcement of alcohol possession on Massachusetts waterways, including the mainstem Deerfield River.	DRWA, Whitewater interests, Massachusetts Environmental Police	2004
Promote increased patrols and enforcement by Massachusetts Environmental Police Officers of off-road vehicle use within restricted areas at state forests.	Massachusetts Environmental Police, MDCR	2005
Develop a fund and process to compensate landowners (i.e., farmers and others) for property damages resulting from uncontrolled passage to lands identified as public resources (i.e., water bodies, access points to trails).	MDCR, Massachusetts Environmental Police	2008
Objective: Expand public river access sites along the mainstem Deerfield for recreational users		
Investigate the feasibility of additional river access points along the mainstem Deerfield River.	MDCR, TU, Whitewater interests, DRWA, MDAR, local farmers	2006
Objective: Promote and provide access to existing and new recreational trail networks on public and private lands in the watershed.		
Collaborate to develop the Green River Greenway for both habitat protection and a recreational trail (FRCOG 2004).	Greenfield, Leyden, and Colrain with the United States Fish and Wildlife Service, MDFG, FLT, The Nature Conservancy (TNC), and the National Park Service (NPS)	2005
Investigate the feasibility of a watershed boundary ridge trail that could be extended into Vermont that would also link village areas to parks, facilities, state forests, wildlife management areas, and town conservation areas (FRCOG 2004).	DRWA, MDCR, Appalachian Mountain Club (AMC), Town trail clubs and Town OSCs	2005

Action Strategy	Lead Parties	Start Date
Hold a regional conference to focus on discussions of recreational trail use issues (e.g. ORV use on sensitive areas) in Western Massachusetts and on the short and long-term solutions (FRCOG 2004).	New England Association of Four –Wheel Drive Clubs, MDCR, Cowls Lumber, Snowmobile Clubs, Town Conservation Commissions, Recreation Commissions, and OSCs, AMC, New England Mountain Bike Association, and other trail clubs	2005
Goal: Protect Open Space and Maintain Rural Landscape		
Objective: Focus new development in the most appropriate areas (FRCOG 2004)		
Develop a model bylaw adaptable by towns that would grant incentives to developers willing to revitalize old buildings rather than develop open space (FRCOG 2004).	FRCOG, BRPC, in conjunction with town Historical Commissions.	2009
Objective: Encourage land use and development patterns that manage growth and preserve scenic, rural character, open space, and water resources, and agricultural and forested lands (FRCOG 2004).		
Explore alternative zoning regulations (e.g., riverfront zoning along riparian corridors) to conserve natural, agricultural, and scenic values (FRCOG 2004).	Town Planning Boards, FRCOG, MDAR and BRPC	2005
Objective: Protect and conserve agricultural lands (FRCOG 2004)		
Collaborate to raise funds for conserving the most important agricultural lands in the watershed (FRCOG 2004).	Farmers, Franklin Land Trust, Valley Land Fund, Mount Grace Land Conservation Trust, The Trustees of Reservations, the Farm Bureau, MDAR, USDA/Natural Resource Conservation Service, Franklin Conservation District, Town Agricultural Commissions	2006
Objective: Identify and conserve parcels of conservation, wildlife, and recreation interest (FRCOG 2004).		
Identify and protect parcels of conservation, wildlife, and recreation interest that are most threatened by development (FRCOG 2004).	Individual towns in collaboration with DRWA, Franklin Land Trust, MDAR and MDCR	2006
Encourage towns to consider passing the Community Preservation Act, or top establish and contribute to their own municipal fund to help purchase and leverage land protection projects (FRCOG 2004).	Town Open Space Committees, Franklin Land Trust, Massachusetts Audubon Society, MDAR and DRWA	2006
Objective: Coordinate with state, regional, and local entities to maximize protection of joint open space resources (FRCOG 2004).		
Identify the most important unprotected open space parcels adjacent to protected lands (FRCOG 2004).	FLT, TTOR, MDAR, BRPC and FRCOG and Town Open Space Committees	2005
Partner with Franklin Land Trust and seek funding from federal, state, and private sources to protect remaining farm and forestland in the watershed as the opportunities arise (FRCOG 2004).	DRWA, Franklin Land Trust, MDAR, and the DRWT	2006

4 POTENTIAL FUNDING SOURCES

- **Deerfield River Basin Environmental Enhancement Trust Fund**

The fund in the amount of $100,000 was established in 1997 to finance watershed conservation, development of low impact recreational and educational projects and facilities, and planning, design, maintenance and monitoring of such facilities and projects. The fund is disbursed on four year cycles. Over the first five cycles, the funds to be disbursed will be limited to 70% of the interest accrued over the previous four years, the remaining interest is to be added to the principal. The last four cycles plus a portion of the principal, to be 20%, 25%, 33%, and 50% of the remaining principal for each of the four distribution cycles respectively. The last distribution cycle will be for all remaining funds in the account. The fund is administered by a committee consisting of USGen, the Vermont Agency of Natural Resources, and EOEA. Eligible fund recipients include nonprofit organizations, educational institutions and units of government within Vermont and Massachusetts. In general, funds are made available on a 50% matching basis; however, the committee is authorized to waive the matching requirement upon an applicant's showing of need. Projects are selected through a competitive grant application basis.

- **MDEP-Section 319 Non-point Source Pollution Grants**

Contact: Jane Peirce: (508) 767-2792, e-mail: jane.peirce@state.ma.us
Summary: To control non-point sources of water pollution, particularly from urban runoff, paved surfaces, and other areas where rainwater collects pollutants as it runs over the land.
Eligibility: Any interested public or private organization.
Match: 40% non-federal match of total project cost. In-kind services eligible for match.
$ Range: $20,000 to $200,000
Examples: This program funds: sub-watershed and in-lake projects that address all major non-point sources affecting water quality in a waterbody; demonstrations of new or innovative best management practices (BMP's), technologies or institutional approaches to controlling non-point source pollution; groundwater projects that target high priority non-point source groundwater problems; and watershed resource restoration projects that restore vegetated wetlands, lakes, rivers, streams, estuaries, shorelines, riparian areas, seagrass beds and other aquatic habitats.
Schedule: An annual Request for Response (RFR) for project solicitation is issued around March 1, with proposals due to MDEP around May 1.

- **MDEP-Massachusetts Clean Water State Revolving Fund Program**

Contact: Steven McCurdy (617) 292-5779, e-mail: steven.mccurdy@state.ma.us
Summary: In an effort to provide incentive to communities to undertake projects with meaningful water quality and public health benefits, this program provides financial assistance to help municipalities and wastewater districts to comply with federal and state water quality requirements. The Program provides subsidized, low-interest loans to finance water quality improvement projects, with particular emphasis on watershed management priorities.
Eligibility: Massachusetts municipalities and waste water districts.
Match: None
$ Range: Maximum applicants limited to 15-20% of annual program capacity. Annual capacity is approximately $150 to $200 million dollars.
Examples: Planning and construction of eligible projects, including new wastewater treatment facilities and upgrades of existing facilities; infiltration/inflow correction; wastewater collection systems; control of combined sewer overflows; and non-point source pollution abatement projects, such as landfill capping, community programs for upgrading septic systems (Title 5), and storm water remediation.
Schedule: Solicitation annually during the summer.

- **Massachusetts Drinking Water State Revolving Fund Program**

Contact: Steven McCurdy (617) 292-5779, e-mail: steven.mccurdy@state.ma.us or Donovan Bowley (617) 292-5523, e-mail: donovan.bowley@state.ma.us
Summary: In an effort to provide incentive to communities to undertake projects with meaningful public health benefits, this program provides financial assistance to help municipalities and public water suppliers to comply with federal and state Safe Drinking Water Act requirements. The Program provides low-interest loans to finance construction or improvement of water treatment facilities, as well as enhancement to distribution systems.
Eligibility: Massachusetts municipalities and community water systems with at least 15 residential connections.
Match: None
$ Range: For calendar years 1998-2003, up to $400 million may be available through the loan program.
Examples: Projects include: New and upgraded drinking water treatment facilities; projects to replace contaminated sources, new water treatment, or storage facilities; consolidation or restructuring of water systems: project and system activities that provide treatment, or effective alternatives to treatment, for compliance with regulated health standards, such as the Surface Water Treatment Rule, installation or replacement of transmission or distribution systems.
Schedule: Applications are accepted annually in the late summer / early fall. Call for more information.

- **MDEP-Section 604(b) Water Quality Management Planning Grants**

Contact: Gary Gonyea: (617) 556-1152, e-mail: gary.gonyea@state.ma.us
Summary: Water quality assessment and management planning.
Eligibility: Regional public comprehensive planning organizations such as: regional planning agencies, councils of government, conservation districts, counties, and cities and towns.
Match: Match not required but proposals are enhanced by demonstration of local support.
$ Range: $30,000 to $60,000
Examples: Provide technical assistance to communities for water supply protection and assist local officials in comprehensive water resource planning.
Schedule: Request for Response is issued by MDEP each October for competitive projects with proposals due approximately six weeks later. Proposals are evaluated and funding is announced within two months of the proposal submission deadline. Generally, projects are expected to begin approximately eight months after the date of their selection by the MDEP.

- **Watershed Project Financing and Construction**

Contact: Central Regional Contact:
Gustav Swanquist (617) 556-1083, e-mail: gustav.swanquist@state.ma.us or
Paul Anderson (508) 792-7692, e-mail: paul.anderson@state.ma.us
Western Regional Contact:
Stanley Linda (617) 292-5736, e-mail: stanley.linda@state.ma.us or
Deirdre Cabral (413) 784-1100 x2148, e-mail: deirdre.cabral@state.ma.us
Summary: State Revolving Loan Program.
Eligibility: Massachusetts municipalities and wastewater districts.
Match: Loans are subsidized, currently at 50% grant equivalency. (Approximately a no-interest loan.)
$ Range: In recent years the program has operated at an annual capacity of $150 to $200 million per year, representing the financing of 40-50 projects annually.
Examples: Project / Design / Construction of municipal water pollution abatement activities, including wastewater treatment facilities, correction of combined sewer overflows, wastewater collection and transmission facilities, nonpoint source projects (including Title 5), and infiltration/inflow removal. Design and construction of projects to protect or improve public drinking water systems, including filtration, disinfection, and distribution.
Schedule: Calendar Year Basis; applications due October 15.

- **Community Septic Management Program**

Contact: Central Regional Office:
Joanne Kasper-Dunn (508) 792-7653 x3763, e-mail: joanne.kasper@state.ma.us
Western Regional Office:
Deirdre Cabral (413) 784-1100 x2148, e-mail: deirdre.cabral@state.ma.us

Summary: Loans for septic system planning and improvements.

Eligibility: Municipalities

Match: None

$ Range: This program has already undergone two rounds of funding. Every community was given a chance to participate during the years 1996-1998. Currently available option: possible grant (up to $15,000) to develop a regional or watershed based septic system management plan. Upon completion of the plan the municipality would receive a minimum $200,000 loan for upgrades. If the community is already participating in the program, and can demonstrate a need for additional funds, then the Regional Coordinator must be contacted through an "Expression of Interest".

Schedule: For new applicants: A two page "Expression of Interest" is required. Call the Regional coordinator for the current schedule.

- **Municipal Recycling Grant Program**

Contact: Brooke Nash: (617) 292 5984, e-mail: brooke.nash@state.ma.us or
Peggy Harlow (617) 292 5861, e-mail: peggy.harlow@state.ma.us

Summary: Recycling equipment, educational materials, and technical assistance grants

Eligibility: Municipalities and regional groups - must provide recycling data sheet and have municipal "Buy Recycled" policy.

Match: Recycling trucks ($20,000 or trade in of old truck requested)
Replacement curbside set-out containers (50% match required)
Recycled paint (50% match required)

$ Range: No restrictions: During FY 99 grants ranged from $7- $112,654

Examples: Recycling grant items include public education information, set out containers, roll off containers, recycling trucks, transfer trailers, hazardous household products equipment, recycled products, and technical assistance. New FY99 grant opportunities include storage sheds for collecting mercury-containing products, grants to pay for the recycling of electronics and mercury-containing products, technical assistance to increase participation in recycling programs.

Schedule: The application process begins in July and the submission deadline is in September.

- **Municipal Recycling Incentive Program (MRIP)**

Contact: Brooke Nash: (617) 292 5984, e-mail: brooke.nash@state.ma.us or
Joseph Lambert: (617) 574-6875, e-mail: joseph.lambert@state.ma.us

Summary: Performance based grant that awards a per ton payment for primary recyclables collected through municipal programs.

Eligibility: Municipalities and regional groups - must meet minimum recycling criteria and elective criteria every 6 months (criteria are cumulative and increase every 6 months).

Match: None

$ Range: During FY 98 payments ranged from $76-$124,649 (Based upon $4/ton for drop-off programs and $8/ton for curbside programs.)

Examples: During FY 99 minimum criteria included: establish a municipal "Buy Recycled" policy and tracking system; establish equal or "parallel" access to both solid waste and recycling collection services; expand recycling access to unserved residents. During FY 98 elective criteria included: Multiple choices in the areas of recycling access, recycling participation, and recycled product procurement.

Schedule: For past fiscal years, the first phase eligibility deadline was December and the second phase eligibility deadline was May. Call for more information.

- **MDEP-Wetlands and Water Quality Grant Program 104(b)(3)**

Contact: Gary Gonyea: (617) 556-1152, e-mail: gary.gonyea@state.ma.us
Summary: This grant program is authorized under Section 104(b)(3) of the federal Clean Water Act. The goal of this program is to fund projects that address MDEP's water quality and wetland protection goals.
Eligibility: All Massachusetts Environmental Affairs agencies or other organizations with a co-sponsor are eligible. Non-profit organizations such as watershed associations, regional planning agencies, and universities are eligible to submit proposals but only through an EOEA sponsoring agency.
Match: Proposals submitted must identify a 25% non-federal match (25% of Total Project Cost).
Schedule: Request for Response is issued by MDEP each January for competitive projects with proposals due approximately eight weeks later.

- **Research and Demonstration Grant Program**

Contact: Arthur Screpetis (617) 767-2875, e-mail: arthur.screpetis@state.ma.us
Summary: This grant program enables the Department of Environmental Protection (DEP) to conduct a program of study and research and demonstration relating to water pollution control and other scientific and engineering studies" so as to insure cleaner waters in the coastal waters, rivers, streams, lakes and ponds of the Commonwealth."
Eligibility: Unsolicited proposals may be submitted at any time to the DEP, by any interested Massachusetts public or private organization.
Schedule: Unsolicited proposals are accepted anytime. Call for more information.

- **MDEP-Source Water Protection Program**

Contact: Kathleen Romero (617) 292-5727, e-mail: kathleen.romero@state.ma.us
Summary: This grant program provides funds to third party technical assistance organizations that assist public water suppliers in protecting local and regional ground and surface water supplies.
Eligibility: 1. Eligible applicants are third party organizations that have experience providing technical assistance related to drinking water protection. 2. Proposed work must benefit active drinking water sources. 3. The third party must submit letter(s) of support from the public water supplier(s) with the application.
Schedule: Request for Response is issued by MDEP each May for competitive projects with proposals due approximately eight weeks later.

- **MDEP-Well Head Protection Grant Program**

Contact: Catherine Sarafinas (617) 556-1070, e-mail: catherine.sarafinas@state.ma.us
Summary: This grant program provides funds to assist public water suppliers in addressing wellhead protection through local projects and education.
Eligibility: Eligible applicants include all community public water systems, as well as non-transient non-community systems that serve schools. The grant recipient must be a public water system or municipality, and the grant must target an active public water supply source.
Examples: Zone I: Removal or upgrade of potential sources of contamination (for example, underground storage tanks, septic systems, salt storage), wellhead protection signs, and fencing in a pump house. Zone II: Interim wellhead Protection Area (IWPA): Land must be owned and controlled by water supplier or the municipality. Containment and improvement projects (secondary containment of liquid hazardous materials, salt/deicing storage, municipal waste management, drainage improvements and hazardous materials storage). Local town-wide inspection programs for floor drains, underground storage tanks, and hazardous materials.
Schedule: Request for Response is issued by MDEP each May for competitive projects with proposals due approximately eight weeks later.

- **EOEA-Massachusetts Executive Order 418-Community Development Planning**

On January 21, 2000, Governor Paul Cellucci and Lieutenant Governor Jane Swift issued Executive Order 418, a measure designed to help communities plan for new housing opportunities while balancing economic development, transportation infrastructure improvements and open space preservation. Executive Order 418 directs the Department of Housing and Community Development, the Executive Office of Environmental Affairs, the Executive Office of Transportation and Construction and the Department of Economic Development to provide assistance to cities and towns for community planning. The order makes available up to $30,000 in planning services to each of the 351 cities and towns in Massachusetts for the creation of a Community Development Plan.

- **EOEA-Planning for Growth Grants**

Contact: Kurt Gaertner: (617) 626-1154 or kurt.gaertner@state.ma.us
Summary: Comprehensive growth planning for cities and towns and development of regional policy plans.
Eligibility: Municipalities and regional planning agencies.
Match: 25%, can be cash or in-kind.
$ Range: Up to $100,000.
Examples: $80,000 to the towns of Buckland and Shelburne for the completion of an inter-municipal comprehensive plan. $50,000 to the Berkshire Regional Planning Commission and the Towns of Lee and Lenox for development of a sub-regional growth policy plan.
Schedule: Call for more information.

- **EOEA-GROWetlands Grant Program**

Contact: Christy Foote-Smith: (617) 292-5991 or cfoote-smith@state.ma.us
Summary: The program funds the implementation of "proactive" (not required by a permit or enforcement action) wetlands restoration projects. The program wishes to promote and support wetland restoration projects that have been identified and prioritized through the GROWetland Initiative, inventories it has conducted of degraded salt marshes, and watershed wetland restoration plans it has developed.
Eligibility: Applicants must be public entities, including counties, town authorities, regional government bodies, or any instrumentality of government. The wetland restoration work to be performed must not be for the purpose of providing wetland mitigation required by a permit or enforcement action.
Match: A grant match is not required, but may result in a more competitive project since the proportion of cash and in-kind contributions toward the total project cost is a criterion for evaluating grant proposals.
$ Range: Although there is no maximum application amount, the total program funds are $100,000 annually. Proposals fall into two categories, but are judged equally: 1) under $50,000 and 2) over $50,000.
Examples: Fundable project costs include: 1) physical activities directly related to wetland restoration such as dredging, filling, ditching, mowing, installation of structures, excavation, planting, grading, and monitoring and 2) the purchase of materials such as culverts, tide gates, and other structures necessary to carry out a successful restoration.
Schedule: All application materials are reviewed by mid-winter annually. Call for more information.

- **EOEA-Corporate Wetlands Restoration Program**

Contact: Christy Foote-Smith: (617) 292-5991 or cfoote-smith@state.ma.us
Summary: This program is funded through a public/private partnership between the Massachusetts Executive Office of Environmental Affairs, in partnership with the US Environmental Protection Agency, other Federal Coastal America partners, and the business and non-profit communities to restore wetlands in Massachusetts' 27 major watersheds. This program manages funds and services contributed by corporate partners, using corporate contributions to facilitate design and construction of wetland restoration projects. Participation in this program is voluntary and flexible. The preferred mode of

giving is a monetary gift to be allocated to a priority wetland restoration project that has been identified by the Wetlands Restoration and Banking Program and recommended for funding by the Corporate Wetlands Restoration Partnership Advisory Board. Corporate Wetland Restoration Partnership monetary contributions may fund restoration projects in their entirety or may be used to match federal grant awards. Alternatively, monetary or in-kind service donations may be targeted to a specific restoration project or toward development of a wetland restoration plan for a specific watershed.
Eligibility: Unlimited as to applicants. Must be a project that meets Wetland Restoration Banking Program's definition of "wetland restoration".
Match: A grant match is not required, but may result in a more competitive project since the proportion of cash and in-kind contributions toward the total project cost is a criterion for evaluation of grant proposals.
$ Range: Unlimited.
Examples: Project activities include: 1) physical activities directly related to wetland restoration such as dredging, filling, ditching, mowing, installation of structures, excavation, planting, grading, and monitoring; 2) the purchase of materials such as culverts, tide-gates, and other structures necessary to carry out a successful restoration; and 3) other activities directly related to wetland restoration such as project design and permitting.
Schedule: Applications are accepted year round. Call for more information.

- **EOEA-Self Help Program**

Contact: Jennifer Soper: (617) 626-1015 or jennifer.soper@state.ma.us
Summary: Funds for acquiring land for conservation and passive recreation purposes.
Eligibility: Municipal Conservation Commissions (A town must have an state approved Open Space and Recreation Plan to be eligible).
Match: 52 70% grant of total project cost: level of funding dependent upon the equalized valuation per capita decile ranking of the community. Please note that this is a reimbursement program, not a matching grants program.
$ Range: The Secretary of EOEA announces Maximum Grant award amount at the onset of each grant round.
Examples: Award to Falmouth to purchase coastal pond property adjacent to larger conservation area.
Schedule: The application process begins in the spring with an application deadline of June 1. A new rolling grant round is in development and will be announced by the Secretary of EOEA. Call for more information.

- **EOEA-Urban Self Help Program**

Contact: Joan Robes: (617) 626-1014 or joan.robes@state.ma.us
Summary: Funds for acquiring land for public outdoor recreation and/or the renovation or development of public outdoor park and recreation facilities.
Eligibility: Municipalities: Town and cities must have a state approved Open Space and Recreation Plan to be eligible.
Match: 52 70% grant of total project cost: level of funding dependent upon the equalized valuation per capita decile ranking of the community. Please note that this is a reimbursement program, not a matching grants program.
$ Range: The Secretary of EOEA announces Maximum Grant award amount at the onset of each grant round.
Examples: Funds to the City of Cambridge to convert Danehy Park from a 50 acre landfill to playing fields and open space.
Schedule: The application process begins in the spring with an application deadline of June 1. A new rolling grant round is in development and will be announced by the Secretary of EOEA. Call for more information

- **MDCR-Lake and Pond Grant Program**

Contact: Steve Asen: (617) 626-1353 or steve.asen@state.ma.us
Summary: Lake and Pond protection, preservation, enhancement, and public access.
Eligibility: Municipalities; co-applications are encouraged from Lake and Pond Associations or Districts, and Watershed Associations.
Match: 50% cash match.
$ Range: $1,000-$10,000
Examples: Controlling non-point pollution; eradicating non-native aquatic plant species, developing lake and watershed management plans.
Schedule: In past years, applications were mailed in October and the deadline was December 31. Call for more information.

- **MDCR-Recreational Trails Program**

Contact: Peter Brandenburg: (617) 626-1453 or peter.brandenburg@state.ma.us
Summary: Construction and improvement of publicly accessible recreational trails.
Eligibility: Municipalities, non-profit groups, and regional and state agencies.
Match: 20% minimum, in-kind permitted.
$ **Range:** $2000-$20,000, exceptions considered.
Examples: Trail building materials; support of volunteer trail maintenance activities.
Schedule: Call for more information.

- **MDCR-Greenways and Trails Demonstration Grants**

Contact: Jennifer Howard: (413) 586-8706 X18; email jennifer.howard@state.ma.us
Summary: Innovative projects that advance the creation and promotion of greenway and trail networks throughout Massachusetts.
Eligibility: Municipalities, regional planning agencies, and non-profit organizations.
Match: None required, although encouraged, including in-kind contributions.
$ Range: $1,000 - $5,000; up to $10,000 available for multi-town projects.
Examples: Improving access to rivers and trails, producing greenway and trail brochures, maps, signs, and curricula, and involving community members in greenway and trail planning and implementation.
Schedule: Applications are due in fall/winter each year - call for more information.

- **MDCR-Urban Forest Planning and Education Grants**

Contact: Edith Makra: (617) 626-1466 or edith.makra@state.ma.us
Summary: Funds to build support for the protection and management of community trees and forest ecosystems.
Eligibility: Municipalities and nonprofit groups.
Match: 100%, in-kind allowed.
$ Range: Up to $10,000
Examples: Tree inventories that involve residents in data collection; hands on training to students to observe, plant and care for trees; workshops and public awareness campaigns; urban environmental analysis (GIS).
Schedule: Applications are due in mid-April. Call for more information.

- **MDCR-Forest Stewardship Program**

Contact: Susan Campbell (413) 256-1201 or susan.campbell@state.ma.us
Summary: Grants to private forest landowners to protect forest ecosystems. Landowners, with assistance of MDCR foresters, develop a forest stewardship plan for their property, which makes them eligible for Federal cost sharing funds to help carry out the plan.

Eligibility: Any forest landowner in Massachusetts, who meets the following criteria: ownership must be private, non-industrial, and non-profit; and forest land must be less than 1,000 acres in total size in the State.
Examples: Forest stewardship plans and implementation can include any project which meets one of the 9 main goals, such as wildlife habitat management, erosion reduction, protection of endangered species, trail creation/maintenance, and timber quality improvement.
Schedule: Applications were due in March of past years.

- **MDAR-Agriculture Environmental Enhancement Program**

Contact: Susan Phinney, Boston (617) 626-1772, e-mail: susan.phinney@state.ma.us
Summary: This program is open to producers and growers who farm 5 acres or more in the state of Massachusetts and have the potential to impact water resources. This program reimburses farmers for the cost of their materials for projects that aim to improve water quality. The farmer is responsible for the cost of installing and maintaining the practice.
Eligibility: Farmers owning farms 5 acres or larger. All applicants must have either an updated USDA Natural Resource Plan or a plan from an approved source such as the one in the "On-Farm Strategies To Protect Water Quality" workbook which can be obtained by calling the Massachusetts Department of Agriculture.
$ Range: The maximum award per project is $20,000. Up to 75% of the cost will be reimbursed prior to the project's completion for projects over $5,000.
Schedule: Annual Request for Response (RFR) is issued in August. Please call for more information.

- **MDAR-Agricultural Preservation Restriction Program**

Contact: Richard M. Chandler: (413) 577-0459, e-mail: rchandler@umext.umass.edu
Summary: The APR Program is a voluntary program which is intended to offer a non-development alternative to farmers and other owners or "prime" and "state important" agricultural land who are faced with a decision regarding future use and disposition of their farms. Towards this end, the program offers to pay farmers the difference between the "fair market value" and the "agricultural value" of their farmland in exchange for a permanent deed restriction which precludes any use of the property that will have a negative impact on its agricultural viability. The state's investment in the APR Program benefits farmers, the state's agricultural industry, the state and local economies, consumers and the general populace in a number of important ways.

- The program works to bolster the state's $532,000,000 agricultural industry by helping to keep farms in active commercial use, and by sending an important signal to the industry and its farmers that Massachusetts is serious about encouraging a strong and viable agricultural economy.

- Farmers whose land is accepted into the program are able to realize equity from their land without being forced to sell their farms for development purposes. The equity is often reinvested back into the protected farm by way of the purchase of more land, equipment or buildings and through the retirement of farm debt.

- A major portion of APR participants spend all or most of their APR funds locally, thereby creating a link between private and public benefit, and adding credence to the assertion that APR monies benefit more than just individual farmers and, in reality, work to stimulate local and state economies.

- The APR Program often represents the only means by which farmers are able to plan their estates to allow for the transfer of ownership of their farms to their children. By reducing the value of restricted farmland to its agricultural value, gift or inheritance taxes can be greatly reduced, thereby eliminating the need for second generation farmers to sell their farmland in order to pay taxes.

- APR restricted farmland represents an opportunity for young farmers just entering the business and other farmers in need of additional land to purchase affordable farmland. The program serves to stabilize farmland values and guarantee the long-term availability of farmland. This factor is especially important in areas with escalating land values and is critical for farmers who rent a large percentage of the land that they farm.

- By protecting farmland, the APR Program works to secure a continued high quality of life for Massachusetts residents. Farmland not only contributes to the scenic beauty of the state, but it provides for clean air and water, wildlife habitat, and recreational opportunities.

Eligibility: Farm must be at least five (5) acres in size. Land has to have been actively devoted to agriculture for the two (2) immediately preceding tax years. At least $500 in gross sales per year plus $5 for each additional acre or 50 cents per each additional acre of woodland and/or wetland. Other criteria staff weigh when considering potential APRs include: Suitability and productivity of land for agricultural use based on soil classification, physical features, location; The degree of threat to the continuation of agriculture on the land due to circumstances such as owner's death, retirement, financial difficulties, development pressure, or insecurity due to rental agreements; and The degree to which the land is of a size or composition to be economically viable for agricultural purposes and the likelihood that it will remain in agriculture for the foreseeable future.
Examples: Since 1980, deed restrictions have been placed on 468 farms totaling approximately 42,000 acres in 130 towns.
Schedule: The program is a rolling application process. If a farmer is interested, the APR Program should be contacted.

- **MDAR-Farm Viability Enhancement Program**

Contact: Craig Richov, (617) 626-1725, e-mail: Craig.Richov@state.ma.us
Summary: This program's purpose is to improve the economic bottom lines and environmental integrity of participating farms through the development and implementation of Farm Viability Plans. These comprehensive, yet focused farm plans, which are to be developed by teams comprised of farmers and other agricultural, economic and environmental consultants, will be aimed at suggesting ways for farmers to increase their on-farm income through such methods as improved management practices, diversification, direct marketing, value-added initiatives and agritourism. In addition, the Plans will make recommendations concerning environmental and resource conservation concerns on participating farms. Financial agreements are made with participating farms upon the completion of such a plan which may include either the purchase of an agricultural covenant by the state for a term of 5 or 10 years, or payment for the implementation of the developed Farm Viability Plan.
$ Range: Technical assistance and the development of business plans are provided at no cost to the farmer. Farmers who are then willing to sign a non-development restriction covenant are eligible to receive funding. Up to $20,000 is available for farmers willing to agree to a covenant for a period of five years. Up to $40,000 is available to farmers willing to agree to a ten year covenant. An awards of up to $60,000 may go to farmers with at least 135 acres, agreeing to a ten year covenant, and meeting certain criteria in their business plans regarding the potential to increase net farm income and to retain or increase the number of farm jobs.
Eligibility: To be eligible for participation in the Program, an applicant must own, or be a co-applicant with the owner of, at least 5 acres of land in agricultural use.
Schedule: Applications are accepted in the spring. Call for more information.

- **NRCS-Environmental Quality Incentives Program (EQIP)**

The Environmental Quality Incentives Program provides technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands

in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation. The purposes of the program are achieved through the implementation of a conservation plan which includes structural, vegetative, and land management practices on eligible land. Five- to ten year contracts are made with eligible producers. Cost-share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, and grazing land management. Fifty percent of the funding available for the program will be targeted at natural resource concerns relating to livestock production. The program is carried-out primarily in priority areas that may be watersheds, regions, or multi-state areas, and for significant statewide natural resource concerns that are outside of geographic priority areas. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Emergency Watershed Program (EWP)**

The purpose of the Emergency Watershed Protection program is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. It is not necessary for a national emergency to be declared for an area to be eligible for assistance. The program objective is to assist sponsors and individuals in implementing emergency measures to relieve imminent hazards to life and property created by a natural disaster. Activities include providing financial and technical assistance to remove debris from streams, protect destabilized streambanks, establish cover on critically eroding lands, repairing conservation practices, and the purchase of flood plain easements. The program is designed for installation of recovery measures. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Wildlife Habitat Incentives Program (WHIP)**

The Wildlife Habitat Incentives Program provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices. For example, cost-sharing for fish passage structures may be available from the WHIP in addition to habitat improvements such as invasive plant control, streambank stabilization and water cooling. USDA and program participants enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts a minimum of 10 years from the date that the contract is signed. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS- Forest Land Enhancement Program (FLEP)**

The Forest Land Enhancement Program (FLEP) is part of Title VIII of the 2002 Farm Bill. FLEP replaces the Stewardship Incentives Program (SIP) and the Forestry Incentives Program (FIP). FLEP is optional in each State and is a voluntary program for non-industrial private forest (NIPF) landowners. It provides for technical, educational, and cost-share assistance to promote sustainability of the NIPF forests FLEP is designed to benefit the environment while meeting future demands for wood products. Eligible practices are tree planting, timber stand improvement, site preparation for natural regeneration, and other related activities. Interested landowners can contact any consulting forester or Steve Anderson (Forest Stewardship Program) at 413-256-1201 or steve.anderson@state.ma.us.

- **NRCS-Conservation Reserve Program (CRP)**

The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter-strips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Flood Risk Reduction Program (FRR)**

The Flood Risk Reduction Program was established to allow farmers who voluntarily enter into contracts to receive payments on lands with high flood potential. In return, participants agree to forego certain USDA program benefits. These contract payments provide incentives to move farming operations from frequently flooded land. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Watershed Surveys and Planning**

The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries. Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance. The focus of these plans is to identify solutions that use land treatment and nonstructural measures to solve resource problems. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Resource Conservation & Development Program (RC&D)**

The purpose of the Resource Conservation and Development (RC&D) program is to accelerate the conservation, development and utilization of natural resources, improve the general level of economic activity, and to enhance the environment and standard of living in authorized RC&D areas. It improves the capability of State, tribal and local units of government and local nonprofit organizations in rural areas to plan, develop and carry out programs for resource conservation and development. The program also establishes or improves coordination systems in rural areas. Current program objectives focus on improvement of quality of life achieved through natural resources conservation and community development which leads to sustainable communities, prudent use (development), and the management and conservation of natural resources. Authorized RC&D areas are locally sponsored areas designated by the Secretary of Agriculture for RC&D technical and financial assistance program funds. NRCS can provide grants for land conservation, water management, community development, and environmental needs in authorized RC&D areas. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Watershed Operations --Small Watershed Program and Flood Prevention Program (WF 08 or P03)**

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance is available. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **NRCS-Wetlands Reserve Program (WRP)**

The Wetlands Reserve Program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30-year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetlands. The 30-year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The voluntary agreements are for a minimum 10-year duration and provide for 75 percent of the cost of restoring the involved wetlands. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the easement or agreement. In all instances, landowners continue to control access to their land. For additional information contact the USDA Natural Resources Conservation Service office serving your county.

- **Mass Riverways-Urban Rivers Small Grants**

Contact: Joan Kimball: (617) 626-1544 or joan.kimball@state.ma.us
Summary: For projects that seek to restore urban rivers.
Eligibility: Municipalities and non-profit groups located in urbanized areas.
Match: No match requirement.
$ Range: $3,000 - $8,000
Examples: First year grants.
Schedule: Call for more information.

- **EPA-Brownfields Economic Redevelopment Initiative**

One Congress St, Boston, MA 02114
617-573-9681 - www.epa.gov/swerosps/bf/html-doc/region01.htm
Provides $200,000 over 2 years for a project involving site assessment, site identification, or remediation planning for Brownfields. Activities can include administration, outreach to stakeholders, and field work.

- **EPA-Sustainable Development Challenge**

One Congress St, Boston, MA 02114
888-372-7341- www.epa.gov/region01/eco/grants/sustaing.html
Aims to encourage communities to work with businesses and government to develop
flexible, locally-oriented approaches that link environmental quality management with sustainable development and revitalization. An example is working with local businesses to develop a comprehensive system for solid waste reduction/reuse/recycling in conjunction with rehabilitating buildings, facades, streetscapes, etc.

- **Massachusetts Environmental Trust Environmental Grants**

Contact: Robin Peach: (617) 727-0249
Summary: The Trust funds projects that: (1) encourage cooperative efforts to raise environmental awareness, and (2) support innovative approaches that can protect and preserve our natural resources, with a special focus on water and related land resources.
Eligibility: Non-profit, community associations, civic groups, schools and institutions for higher education, municipalities, and state agencies.
Match: See individual program guidelines.
$ Range: See individual program guidelines.
Examples: Recipients have included the Coalition for Buzzards Bay, Springfield Science Museum, Pioneer Valley Planning Commission, Association for the Preservation of Cape Cod, and many others.

Schedule: Annual Request for Response is available on October and Letters of Inquiry are due in December. All program guidelines are available on the Trust's web site. http://www.agmconnect.org/maenvtr1.html.

- **MHD-Transportation Enhancement Funds**

Contact: Linda Walsh: (617) 973 8052 or linda.walsh@state.ma.us
Summary: Funds for environmental remediation of transportation impacts; transportation improvements including pedestrian and bicycle pathways.
Eligibility: Municipalities apply through regional planning agencies.
Examples: Barnstable Walkway to the Sea (land acquisition for harbor access); stormwater remediation, best management practices, in Mashpee.
Schedule: Call for more information.

- **MHFA-Homeowner Septic Repair Loan Program**

Contact: (617) 854-1020 or (617) 854-1333
Summary: Through a combined effort of the Department of Environmental Protection, the Massachusetts Department of Revenue, and the Massachusetts Housing Finance Agency, this program provides below market rates to homeowners upgrading septic systems.
Eligibility: Homeowner septic repair loans are available to eligible homeowners at low interest rates of 0%, 3%, and 5%, depending on income.
$ Range: Homeowner loans range in size from $1,000 to a maximum of $25,000.
Schedule: Call for more information.

- **MDHCD-Municipal Incentive Grant Program**

Contact: Don Martin, Program Coordinator: (617) 727 7001, x 404
Summary: The Municipal Incentive Grant Program (MIG) is designed to assist local government officials in the planning, management and operation of cities and towns, and in the training of local officials. The program provides grants to pay for consultant assistance and, in some cases, hardware and software. MIG funds enable communities, individually or working together, to address particular issues, define solutions and implement improvements in service delivery. Nonpoint source related plans may be eligible.
Eligibility: Must be a municipality, county government, or Regional Planning Agency. Maximum grants are $35,000 for local and $60,000 for regional projects.
Examples: Growth management strategies, affordable housing strategies, design of regional arrangements for service delivery, creation or enhancement of fiscal management practices, development of Geographic Information Systems (GIS).
Schedule: Call for more information.

- **MDHCD-Community Development Action Grant (CDAG) Program**

Contact: Carol Harper, Program Manager: (617) 727 7001 x483
Summary: This program provides primarily infrastructure support for projects promoting economic development. Project must demonstrate public benefit. CDAG funding limited to 50% of the total project cost; applicant must demonstrate financing commitments of public and private sources. CDAG funds the "minimum amount necessary to make the project feasible." All matching funds must be in place before CDAG funds can be expended.
Match: For each CDAG dollars, you need $.50 local; and $2.50 private.
$ Range: $100,000 to $1,000,000.
Examples: Extension of water and/or sewer service to an industrial park. Road construction/improvement in industrial/commercial area with best management practices.

Eligibility: Municipalities only. These funds are to be utilized on public infrastructure projects and are intended to address substandard or blighted conditions. Land to be improved must be publicly owned. Pre application process, followed by full application.
Schedule: Rolling admission program. Call for more information.

- **MDHCD-Community Development Block Grant Program**

Contact: Toni Hall, Community Development Specialist: (617) 727 7001, x428 Robert Shumeyko, Program Manager, (617) 727 7001, x 435
Summary: Support of community and economic development projects that benefit low and moderate income persons.
Funding: U.S. Department of Housing and Urban Development. DHCD administers competitive grant program for state's non entitlement communities (e.g., under 50,000 population).
Eligibility: Municipalities under 50,000 population, either individually or in regional arrangements. Contact DHCD for application.
Examples: Use rehabilitation (includes septic system repairs), water and sewer improvements, public facilities construction and improvements, e.g., parks and playgrounds, planning, economic development, neighborhood revitalization. List of eligible projects is extensive. Call for details.
Schedule: Application for Community Development Fund I and II were due on or before August 1 in past years. (Community Development Fund usually has one competitive round annually).

- **MDR-Underground Storage Tank Program**

Contact: Stuart Glass, Grant Manager (617) 887 5978 or stuart.glass@state.ma.us
Summary: This program, administered by the Massachusetts Department of Revenue and funded annually (up to 2 million dollars) by the Underground Storage Tank Petroleum Cleanup Fund (MGL c21J), provides municipal grants for the removal and installation of underground storage tanks.
Eligibility: Municipalities.
$ Range: Grants can be up to 50% of eligible costs
Schedule: Applications are accepted annually in the early Fall. Call for more information or visit www.state. ma .us/ust.

5 REFERENCES

Banks, Carrie, Deerfield River Recreational Safety Study, 2001.

Deerfield River Watershed Association (DRWAa), Serrentino, Patricia and Strules, Jennifer, Deerfield River Watershed Volunteer Wetland Monitoring Project-Final Report 1999-2001, 2003.

Deerfield River Watershed Association (DRWAb), Serrentino, Patricia, Japanese Knotweed Inventory of Selected Tributaries of the Deerfield River, 2003.

Federal Energy Regulatory Commission (FERC), Final Environmental Impact Statement, Deerfield River Projects, 1997.

Fuss & O'Neill, Inc., Deerfield River Watershed Landfill Assessment, Massachusetts Watershed Initiative Project, 2003.

Franklin Regional Council of Governments (FRCOG), Deerfield River Watershed Open Space and Recreation Plan, June 2004.

Massachusetts Department of Environmental Protection (MDEP), Final Massachusetts Section 303(d) List of Waters 1998, Massachusetts Department of Environmental Protection, Division of Watershed Management, 1999.

Massachusetts Department of Environmental Protection (MDEPa), Deerfield River Watershed: 2000 Water Quality Assessment-DRAFT, July 2003.

Massachusetts Department of Environmental Protection (MDEPb), Massachusetts Year 2002 Integrated List of Waters, September 2003.

Massachusetts Division of Fish and Wildlife (MDFW), Rare Species Recovery and Ecological Restoration, Press Release. 2000.

Massachusetts Division of Fish and Wildlife (MDFW), Upland Habitat Management Program, http://www.state.ma.us/dfwele/dfw/bdi/UPLANDINTRO.HTM, 2004.

Massachusetts Department of Pubic Health (MDPH), Freshwater Fish Consumption Advisory List, 2002.

Massachusetts Geographic Information System (MassGIS), http://www.state.ma.us/mgis/database.htm, 2003.

Natural Heritage and Endangered Species Program (NHESP), http://www.state.ma.us/dfwele/dfw/nhesp, 2003.

USGen New England, Inc. (USGen), Deerfield River Hydroelectric Project, Instream Recreation Safety Study, FERC License Article 425, 2000.

United States Department of Agriculture (USDA), Forest Inventory Assessment, 1998.

United State Fish and Wildlife Service (USFWS), Migratory Fish Ranges, http://www.fws.gov/r5crc/stuff/migmaps.html, 1999.

Vermont Agency of Natural Resources (VANR), Basin 12-Deerfield River Watershed Assessment Report, March 2003.

APPENDIX A

List of Advisory Committee Members

Name	Affiliation
Amy Singler	Mass. Riverways
Andrea Donlon	Connecticut River Watershed Council
Dick Starkey	Franklin Conservation District
Pat Serrentino	Deerfield River Watershed Association
Carrie Banks	Deerfield River Watershed Association
Polly Bartlett	Deerfield River Watershed Association
Matthew Cole	USGen New England

List of Meeting Participants[6]

Name	Affiliation
Amy Singler	Mass Riverways
Andrea Donlon	Connecticut River Watershed Council
Dick Starkey	Franklin Conservation District
Pat Serrentino	Deerfield River Watershed Association
Carrie Banks	Deerfield River Watershed Association
Polly Bartlett	Deerfield River Watershed Association
John Bennett	Franklin Conservation District/Windham Regional Commission
Marie-Francoise Walk	Deerfield River Watershed Association
Bruce Bennett	Massachusetts Department of Fish and Game-Environmental Police
Tom Brule	Town of Florida
John Burns	Trout Unlimited
Richard Chandler	Massachusetts Department. of Agricultural Resources
Tom Christopher	New England FLOW
Shawn Freeman	Moxie Outdoor/Wilderness
Ellen Krause	Massachusetts Department of Agricultural Resources
Bill Labich	Franklin Regional Council of Governments
Bruce Lessells	Zoar Outdoor
Tom Lively	Town of Heath Selectboard
Andrew Madden	Massachusetts Department of Fish and Game
Peter Millanesi	Massachusetts Department of Fish and Game
Don Pugh	Trout Unlimited
Scott Sumner	Interested Member of the Public
Barry Coppinger	Trout Unlimited
Lester Garvin	Town of Ashfield
Michael Scibelli	Massachusetts Department of Fish and Game-Environmental Police
Paul Karczmarczyk	Ruffed Grouse Society
Lynn Rose	Deerfield Development Ad Hoc Committee
Leonard Lafloud	Town of Rowe Selectman
Jennifer Silva	Interested Member of the Public
James Bates	Interested Member of the Public
Joseph Gagnon	Interested Member of the Public
Mark Benjamin	
Jeff Boettner	
Cynthia Boettner	

[6] Includes attendees of the 3/3/04, 3/18/04 (both daytime and evening), and 3/31/04 sessions, as well as the 4/24/04 watershed forum

Name	Affiliation
Alan Dann	
Don Freeman	
Margaret Freeman	
Dave Gott	
Sherrill Hogan	
Sara Izquierdo	
Mary Kendrick	
Elizabeth Lokocz	
Robert May	Deerfield River Watershed Association
Karl Meyer	Deerfield River Watershed Association
Kathleen O'Rourke	
John Payne	
Susie Robbins	
Davenport Smith	
Pamela Snow	
Rita Thibodeau	Natural Resource Conservation Service
Gisella Walker	Deerfield River Watershed Association
Tony Walker	Deerfield River Watershed Association
Ellen Weeks	
Mark Zenick	

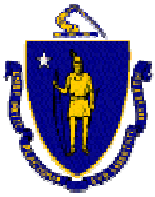
List of Town Conservation Commissions and Planning Boards Members Contacted

Name	Affiliation
John Cohen	Buckland Planning Board
John Organ	Buckland Conservation Commisions
Ursula Nebiker	Charlemont Planning Board
Ruth M. Cannavo	Charlemont Conservation Commission
Don Purington	Colrain Planning Board
Spike Wheeler	Colrain Conservation Commission
Deborah Phillips	Heath Planning Board
William Lattrell	Heath Conservation Commission
	Monroe Planning Board and Conservation Commission
Ellen Babcock	Rowe Conservation Commission
Mike Posever	Rowe Planning Board
Alan Smith	Shelburne Conservation Commission
Charles Walker	Shelburne Planning Board
	Florida Planning Board and Conservation Commission
Roxanne Wedegartner	Greenfield Planning Board
Clarita Shaefer	Greenfield Conservation Commission
Jerry Lund	Leyden Planning Board
Richard Dimatteo	Leyden Conservation Commission
Michael Fitzgerald	Ashfield Planning Board
Barbara Lagoy	Ashfield Conservation Commission
Debbie Kaczowski	Savoy Conservation Commission
Joe Strzegowski	Conway Planning Board
Peter Labarbara	Deerfield Planning Board
Steve Barrett	Deerfield Conservation Commission

APPENDIX B

Deerfield River Watershed Team

Name	Affiliation
Chris Duerring	Department of Environmental Protection
Mark Schleeweis	Department of Environmental Protection
Mike Gildesgame	Department of Conservation and Recreation
Paul Adams	Department of Conservation and Recreation
Dennis Moore	Department of Conservation and Recreation
Amy Singler	Department of Fish and Game
Dave Basler	Department of Fish and Game, CT Valley District
Andrew Madden	Department of Fish and Game, Western District
John Raschko	Office of Technical Assistance
Richard Hubbard	Department of Agricultural Resources
Rita Thibodeau	Natural Resources Conservation Service
Marie-Francoise Walk	DRWA Board, Vice President
Peggy Sloan	Franklin Regional Council of Governments (FRCOG)
Kimberly Noake-McPhee	FRCOG
Bill Labich	FRCOG
Polly Bartlett	DRWA Board Member
Ted Merrill	DRWA Board Member
Gisela Walker	DRWA Board, President
Patricia Serrentino	DRWA member
Sandra Shields	Greenfield WWTP Operator, Greenfield Town Hall DPW
Maryalice Fischer	PG&E NEG.
Matthew Cole	PG&E NEG.
Carrie Banks	DRWA Board
Jonas Kron	Attorney
Peg McDonough	CRWC
Ellen Krause	Department of Agricultural Resources
Charlie Olchowski	Millers/Deerfield Trout Unlimited
Paul Gorecki	Deerfield/Millers TU
John Burns	Taconic TU
Dick Starkey	Franklin Conservation District
Andrea Donlon	CRWC
Barry Coppinger	Deerfield/Millers Chapter of Trout Unlimited



Mitt Romney
Governor

Kerry Healey
Lt. Governor

Ellen Roy Herzfelder
Secretary

Executive Office of Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

(617) 626-1000
http://www.mass.gov/envir/